

Part 2

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The
OUTLINE of HISTORY
BY
H. G. WELLS.



The
**MAKING
OF MAN**

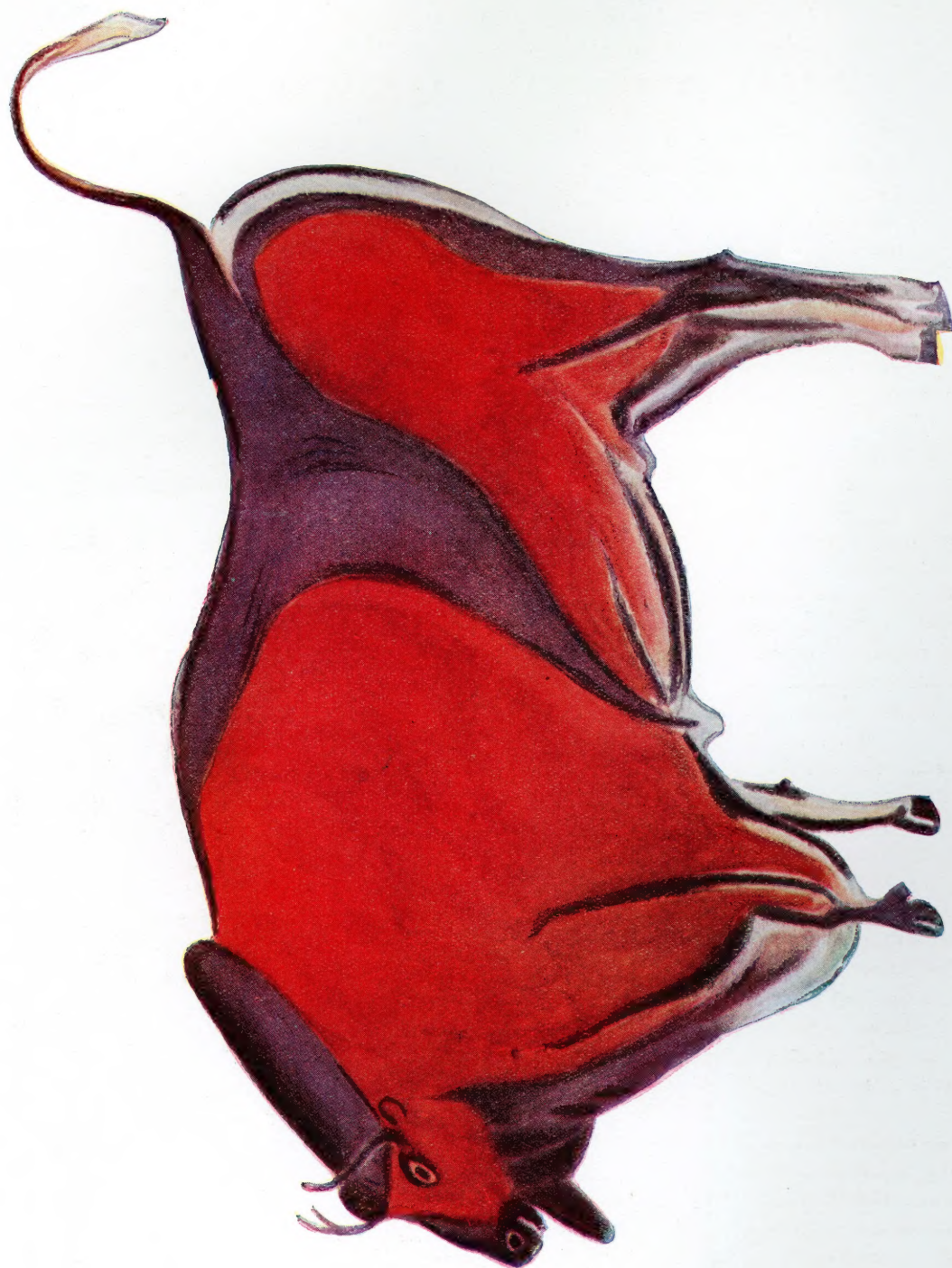
THE OUTLINE OF HISTORY BY H.G. WELLS

PART 3

PUBLISHED DEC. 19TH

In Part 3 Mr. Wells continues the engrossing story of the Development of Mankind, and gives a broad and clear outline of the Development of Early Thought, the Races and Languages of Mankind, and the Aryan-Speaking Peoples in Prehistoric Times. Never before has the wide range of authoritative knowledge on these subjects been presented in such a luminous and concise narrative.

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PALÆOLITHIC PAINTING OF A BISON FROM THE ALTAMIRA CAVE

VII

THE AGE OF MAMMALS

§ 1

THE third great division of the geological record, the Cainozoic, opens with a world already physically very like the world we live in to-day. Probably the day was at first still perceptibly shorter, but the scenery had become very modern in its character. Climate was, of course, undergoing, age by age, its incessant and irregular variations; lands that are temperate to-day, have passed, since the Cainozoic age began, through

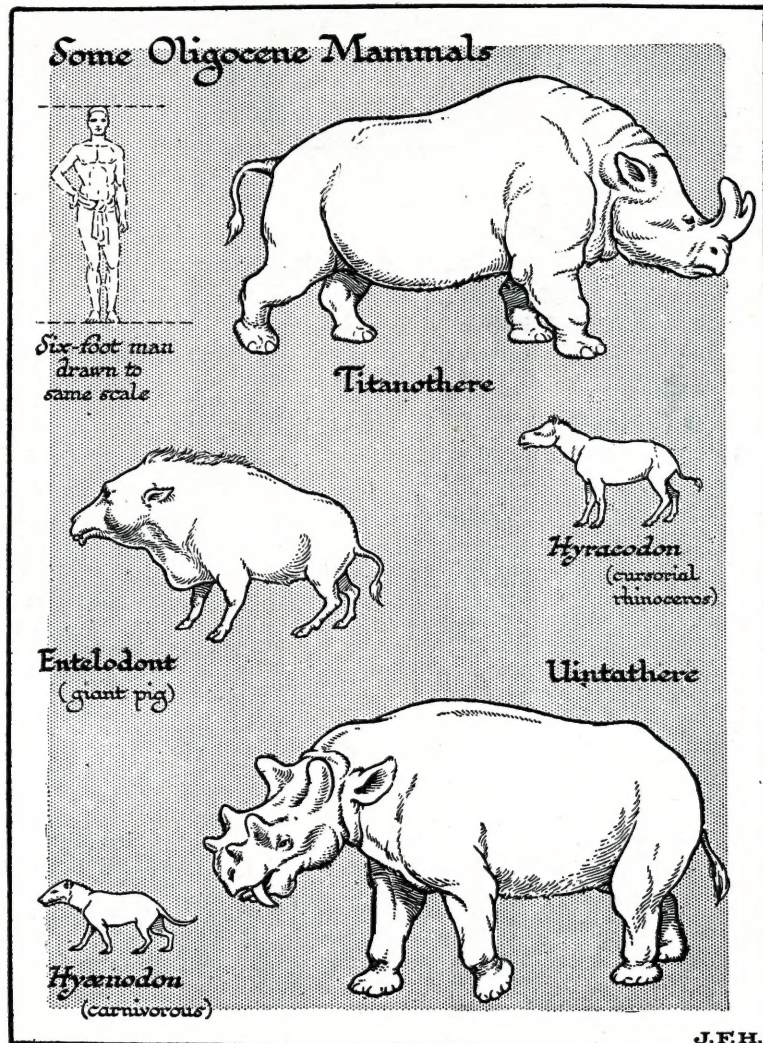
A New Age of Life.

phases of great warmth, intense cold, and extreme dryness; but the landscape, if it altered, altered to nothing that cannot still be paralleled to-day in some part of the world or other. In the place of the cycads sequoias, and strange conifers of the Mesozoic, the plant names that now appear in the lists of fossils include birch, beech, holly, tulip trees, ivy, sweet gum, bread-fruit trees. Flowers have developed concurrently with bees and butterflies. Palms are now very important. Such plants had already been in evidence in the later levels of the (American Cretaceous) Mesozoic, but now they dominate the scene altogether. Grass is becoming a great fact in the world. Certain grasses too had appeared in the later Mesozoic, but only with the Cainozoic period came grass plains and turf spreading wide over a world that was once barren stone.

The period opened with

a long phase of considerable warmth; then the world cooled. And in the opening of this third part of the record, this Cainozoic period, a gigantic crumpling of the earth's crust and an upheaval of mountain ranges was in progress. The Alps, the Andes, the Himalayas, are all Cainozoic mountain ranges; the background of an early Cainozoic scene to be typical should display an active volcano or so. It must have been an age of great earthquakes.

Geologists make certain main divisions of





ANOTHER RESTORATION OF A TITANOTHERE (EARLY CAINOZOIC).

the Cainozoic period, and it will be convenient to name them here and to indicate their climate. First comes the *Eocene* (dawn of recent life), an age of exceptional warmth in the world's history, subdivided into an older and newer Eocene; then the *Oligocene* (but little of recent life), in which the climate was still equable. The *Miocene* (with living species still in a minority) was the great age of mountain building, and the general temperature was falling. In the *Pliocene* (more living than extinct species), climate is very much at its present phase; but with the *Pleistocene* (a great majority of living species) there sets in a long period of extreme conditions—it is the Great Ice Age. Glaciers spread from the poles towards the equator, until England to the Thames is covered in ice. Thereafter to our own time comes a period of partial recovery.

§ 2

In the forests and following the grass over the Eocene plains there appeared for the first time a variety and abundance of mammals. Before we proceed to any description of these mammals, it may be well to note in general terms what a mammal is.

Tradition
comes into
the World.

From the appearance of the vertebrated animals in the Lower Palæolithic Age, when the fish first swarmed out into the sea, there has been a steady progressive development of vertebrated creatures. A fish is a vertebrated animal that breathes by gills and can live only in water. An amphibian may be described as a fish that has added to its gill-breathing the power of breathing air with its swimming bladder in adult life, and that has also developed limbs with five toes to them in place of the fins of a fish. A tadpole is for a time a fish, which becomes a land creature with limbs and toes as it develops. A reptile is a further stage of detachment; it is an amphibian that is no longer amphibious; it passes through its tadpole stage, its fish stage, that is—in an egg. From the beginning it must breathe in air; it can never breathe under water as a tadpole can do. Now, a modern mammal is really a sort of reptile that has developed a peculiarly effective protective covering, hair; and that also retains its eggs in the body until they hatch so that it brings forth living young (viviparous), and even after birth it cares for them and feeds them by its mammæ for a longer or shorter period. Some reptiles, some vipers

for example, are viviparous, but none stand by their young as the real mammals do. Both the birds and the mammals, which escaped whatever destructive forces made an end to the Mesozoic reptiles, and which survived to dominate the Cainozoic world, have these two things in common: first, a far more effective protection against changes of temperature than any other variation of the reptile type ever produced, and, secondly, a peculiar care for their eggs, the bird by incubation and the mammal by retention, and a disposition to look after the young for a certain period after hatching or birth. There is by comparison the greatest carelessness about offspring in the reptile.

Hair was evidently the earliest distinction of the mammals from the rest of the reptiles. It is doubtful if the particular Theriodont reptiles who were developing hair in the early Mesozoic were viviparous. Two mammals survive to this day which not only do not suckle their young, but which lay eggs, the *Ornithorhynchus* and the *Echidna*, and in the Eocene there are a number of allied forms. They were the survivors of what was probably a much larger number and variety of small egg-laying hairy creatures, hairy reptiles, hoppers, climbers, and runners, which included the Mesozoic ancestors of all existing mammals up to and including man.

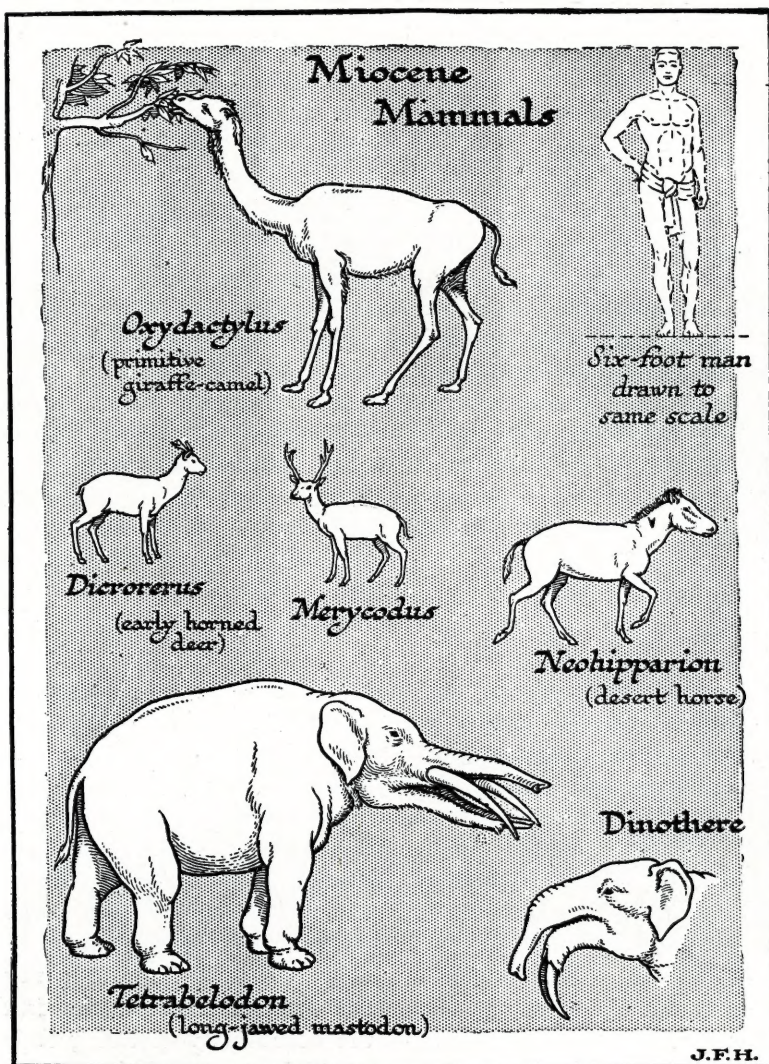
Now we may put the essential facts about mammalian reproduction in another way. *The mammal is a family animal.* And the family habit involved the possibility of a new sort of continuity of experience in the world. Compare the completely closed-in life of an individual lizard with the life of even a quite lowly mammal of almost any kind. The former has no mental continuity with anything beyond itself; it is a little self-contained globe of experience that serves its purpose and ends; but the latter "picks up" from its mother, and "hands on" to its offspring. All the mammals, except for the two genera we have named, had already before the lower Eocene age arrived at this stage of pre-adult dependence and imitation. They were all more or less imitative in youth and capable of a certain modicum of education; they all, as a part of their development, received a certain amount of care and example and even direction from

their mother. This is as true of the hyena and rhinoceros as it is of the dog or man; the difference of educability is enormous, but the fact of protection and educability in the young stage is undeniable. So far as the vertebrated animals go, these new mammals, with their viviparous, young-protecting disposition, and these new birds, with their incubating, young-protecting disposition, introduce at the opening of the Cainozoic period a new thing into the expanding story of life, namely, social association, the addition to hard and inflexible instinct of *tradition*, and the nervous organisation necessary to receive tradition.

All the innovations that come into the history of life begin very humbly. The supply of blood-vessels in the swimming bladder of the mudfish in the lower Palæozoic torrent-river, that enabled it to pull through a season of drought, would have seemed at that time to that bodiless visitant to our planet we have already imagined, a very unimportant side fact in that ancient world of great sharks and plated fishes, sea-scorpions, and coral reefs and seaweed; but it opened the narrow way by which the land vertebrates arose to predominance. The mudfish would have seemed then a poor refugee from the too crowded and aggressive life of the sea. But once lungs were launched into the world, every line of descent that had lungs went on improving them. So too in the upper Palæozoic, the fact that some of the Amphibia were losing their "amphibiousness" by a retardation of hatching of their eggs, would have appeared a mere response to the distressful dangers that threatened the young tadpole. Yet that prepared the conquest of the dry land for the triumphant multitude of the Mesozoic reptiles. It opened a new direction towards a free and vigorous land-life along which all the reptilian animals moved. And this viviparous, young-tending training that the ancestral mammalia underwent during that age of inferiority and hardship for them, set going in the world a new continuity of perception, of which even man to-day only begins to appreciate the significance.

§ 3

A number of types of mammal already appear in the Eocene. Some are differentiating in



one direction, and some in another, some are perfecting themselves as herbivorous quadrupeds, some leap and climb among the trees, some turn back to the water to swim, but all types are unconsciously exploiting and developing the brain which is the instrument of this new power of acquisition and educability. In the Eocene rocks are found small early predecessors of the horse (*Eohippus*), tiny camels, pigs, early tapirs, early hedgehogs, monkeys and lemurs, opossums and carnivores. Now, all these were more or less ancestral to living forms, and all have brains relatively much smaller than their living representatives. There is, for instance, an early rhinoceros, *Titanoherium*, with a brain not one tenth the size of that of

An Age of
Brain
Growth.

the existing rhinoceros. The latter is by no means a perfect type of the attentive and submissive student, but even so it is ten times more observant and teachable than its predecessor. This sort of thing is true of all the orders and families that survive until to-day. All the Cainozoic mammals were doing this one thing in common under the urgency of a common necessity; they were all growing brain. It was a parallel advance. In the same order or family to-day, the brain is usually from six to ten times what it was in the Eocene ancestor.

Grass was now spreading over the world, and with this extension arose some huge granivorous brutes of which no representative survives to-day. Such were the *Uintatheres* and the *Titanotheres*. And in pursuit of such

beasts came great swarms of primitive dogs, some as big as bears, and the first cats, one in particular (*Smilodon*), a small fierce-looking creature with knife-like canines, the first sabre-toothed tiger, which was to develop into greater things. American deposits in the Miocene display a great variety of camels, giraffe camels with long necks, gazelle camels, llamas, and true camels. North America, throughout most of the Cainozoic period, appears to have been in open and easy continuation with Asia, and when at last the glaciers of the Great Ice Age, and then the Bering Straits, came to separate the two great continental regions, the last camels were left in the old world and the llamas in the new.

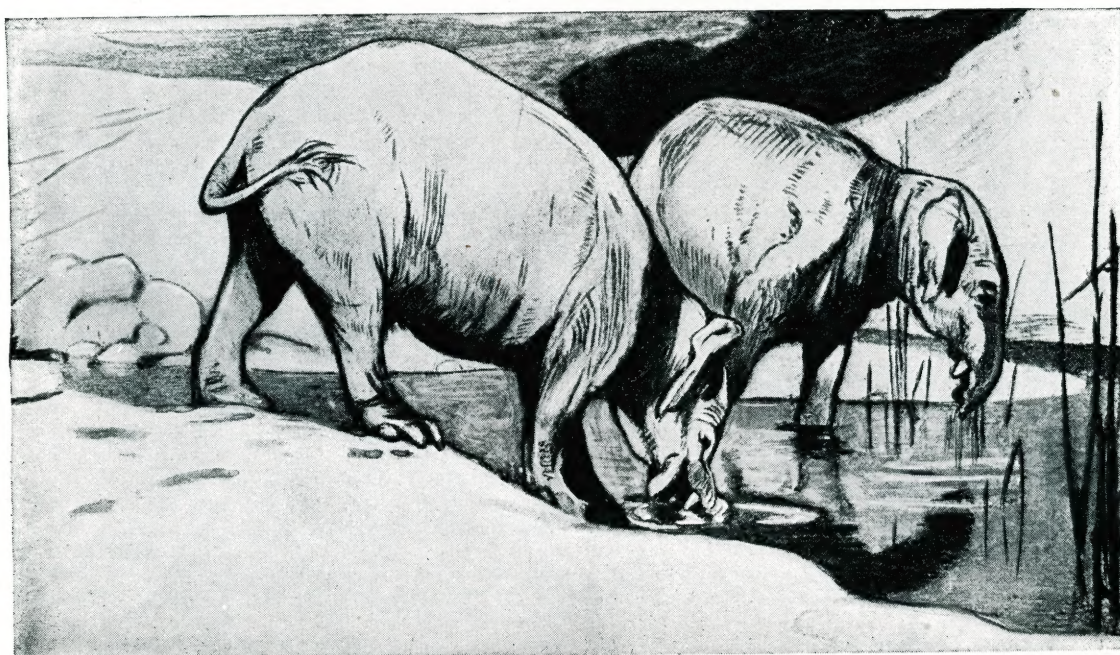
In the Eocene the first ancestors of the elephants appear in northern Africa as snouted creatures; the elephant's trunk dawned on the world in the Miocene.

One group of creatures is of peculiar interest in a history that is mainly to be the story of mankind. We find fossils in the Eocene of monkeys and lemurs, but of one particular creature we have as yet not a single bone. It was a lemur-like creature that clambered about the trees and ran, and probably ran well, on its hindlegs upon the ground. It was small-brained by our present standards, but it had

clever hands with which it handled fruits and beat nuts upon the rocks and perhaps caught up sticks and stones to smite its fellows. It was our ancestor.

§ 4

Slowly through vast intervals of time the spinning world circled about the sun, and slowly its orbit, which may have been nearly circular during the equable days of the early Eocene, was drawn by the attraction of the circling outer planets into a more elliptical form. Its axis of rotation, which had always heeled over to the plane of its orbit, as the mast of a yacht under sail heels over to the level of the water, heeled over by imperceptible degrees a little more and a little more. And each year its summer point shifted a little further from perihelion round its path. These were small changes to happen to a one-inch ball, circling at a distance of 330 yards from a flaming sun nine feet across, in the course of a few million years. They were changes an immortal astronomer in Neptune, watching the earth from age to age, would have found almost imperceptible. But from the point of view of the surviving mammalian life of the Miocene, they mattered pro-



ANOTHER RESTORATION OF AN EARLY ELEPHANTINE FORM (MIOCENE).

foundly. Age by age the winters grew on the whole colder and harder and a few hours longer relatively to the summers in a thousand years ; age by age the summers grew briefer. On an average the winter snow lay a little later in the spring in each century, and the glaciers in the northern mountains gained an inch this year, receded half an inch next, came on again a few inches. . . .

The Record of the Rocks tells of the increasing chill. The Pliocene was a temperate time, and many of the warmth-loving plants and animals had gone. Then, rather less deliberately, some feet or some inches every year, the ice came on.

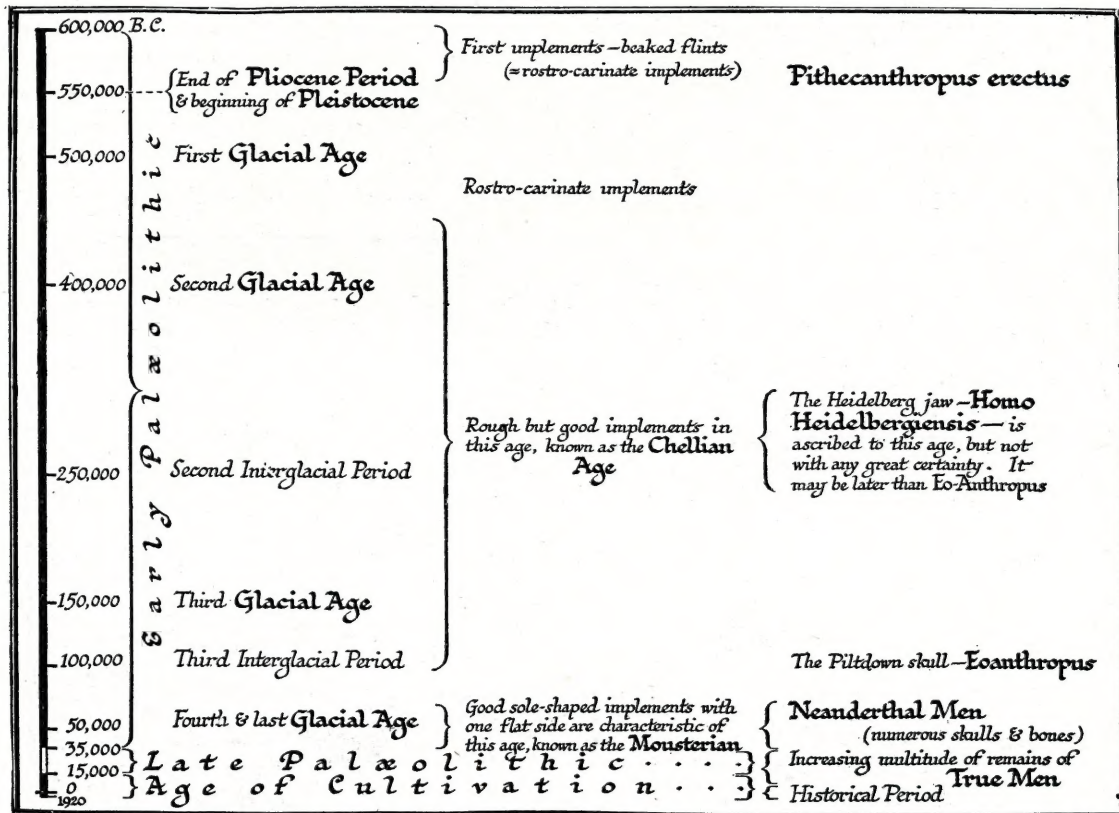
An arctic fauna, musk ox, woolly mammoth, woolly rhinoceros, lemming, ushers in the Pleistocene. Over North America, and Europe and Asia alike, the ice advanced. For thousands of years it advanced, and then for thousands of years it receded, to advance again. Europe down to the Baltic shores, Britain down to the

Thames, North America down to New England, and more centrally as far south as Ohio, lay for ages under the glaciers. Enormous volumes of water were withdrawn from the ocean and locked up in those stupendous ice caps so as to cause a world-wide change in the relative levels of land and sea. Vast areas were exposed that are now again sea bottom.

The world to-day is still coming slowly out of the last of four great waves of cold. And it is amidst this crescendo and diminuendo of frost and snow that we first recognize forms that are like the forms of men. The Age of Mammals culminated in ice and hardship and man.

§ 5

Time guesses about the periods of the great age of cold are still vague, but we will follow H. F. Osborn in accepting as our guides the estimates of



TIME DIAGRAM OF THE GLACIAL AGES.

The reader should compare this diagram carefully with our first time diagram, Chapter II, § 2. That diagram, if it were on the same scale as this one, would be between 44 and 440 feet long.

Albrecht Penck¹ and C. A. Reeds.² These give the

Pleistocene Age.	{	FIRST GLACIAL AGE as at its maximum about 500,000 years ago.
		<i>First Interglacial Period.</i>
		SECOND GLACIAL AGE maximum 400,000 years ago.
		<i>Second Interglacial Period.</i>
		THIRD GLACIAL AGE maximum 150,000 years ago.
		<i>Third Interglacial Period.</i>

¹ *Die Alpen in Eiszeitalters*, vol. iii.

² "Graphic Projection of Pleistocene," "Climatic Oscillations," in *Bulletin of Geological Soc. Am.*, vol. xxvi.

Pleistocene Age (cont.)	{	FOURTH AND LAST GLACIAL AGE maximum 50,000 years ago.
		<i>A Period of temperate climate.</i> The amelioration set in perhaps 35,000 years ago.

With some subsequent fluctuations. Remains of bog oaks, for example, which grew two or three thousand years ago, are found in Scotland at latitudes in which not even a stunted oak will grow at the present time.

BOOK II

THE MAKING OF MAN

VIII

THE ANCESTRY OF MAN³

§ I

THE origin of man is still very obscure. It is commonly asserted that he is "descended" from some man-like ape such as the chimpanzee, the orang-utang, or the gorilla, but that of course is as reasonable

as saying that I am "descended" from some Hottentot or Esquimau as young or younger than myself.

Others, alive to this objection, say that man is descended from the common ancestor of the chimpanzee, the orang-utang, and the gorilla. Some "anthropologists" have even indulged in a speculation whether mankind may not have a double or treble origin: the negro being descended from a gorilla-like ancestor, the Chinese from a chimpanzee-like ancestor, and so on. These are very fanciful ideas. Reasons have recently been given for

doubting whether man is nearly so close to the great apes as was formerly supposed.

Of course if one puts the skeleton of a man and the skeleton of a gorilla side by side, their general resemblance is so great that it is easy to jump to the conclusion that the former is derived from such a type as the latter by a process of brain growth and general refinement. But if one examines closely into one or two differences, the gap widens. The particular difference upon which stress is laid is the foot. Man walks on his toe and his heel; his great toe is his chief lever in walking, as the reader may see for himself if he examines his own footprints on the bathroom floor and notes where the pressure falls as the footprints become fainter. His great toe is the king of his toes.

Among all the apes and monkeys, the only group that have their great toes developed on anything like the same fashion as man are some of the lemurs. The baboon walks on his hind-legs it is true, but he walks on a flat foot and all his toes, using his middle toe as his chief throw off, much as the bear does. And the three great apes all walk on the outer side of the foot, never touching the ground with the great toes at all, in an entirely different manner

³ In this and the next chapters the writer has used Osborn's *Men of the Old Stone Age*, Sollas' *Ancient Hunters*, Dr. Keith's *Antiquity of Man*, W. B. Wright's *The Quaternary Ice Age*, Worthington Smith's *Man, the Primeval Savage*, F. Wood Jones' *Arboreal Man*, H. G. F. Spurrell's *Modern Man and his Forerunners*, O. T. Mason's *Origins of Invention*, Parkyn's *History of Prehistoric Art*, Salomon Reinach's *Repertoire de l'Art Quaternaire*, and various of the papers in Ray Lankester's *Science from an Easy Chair*.

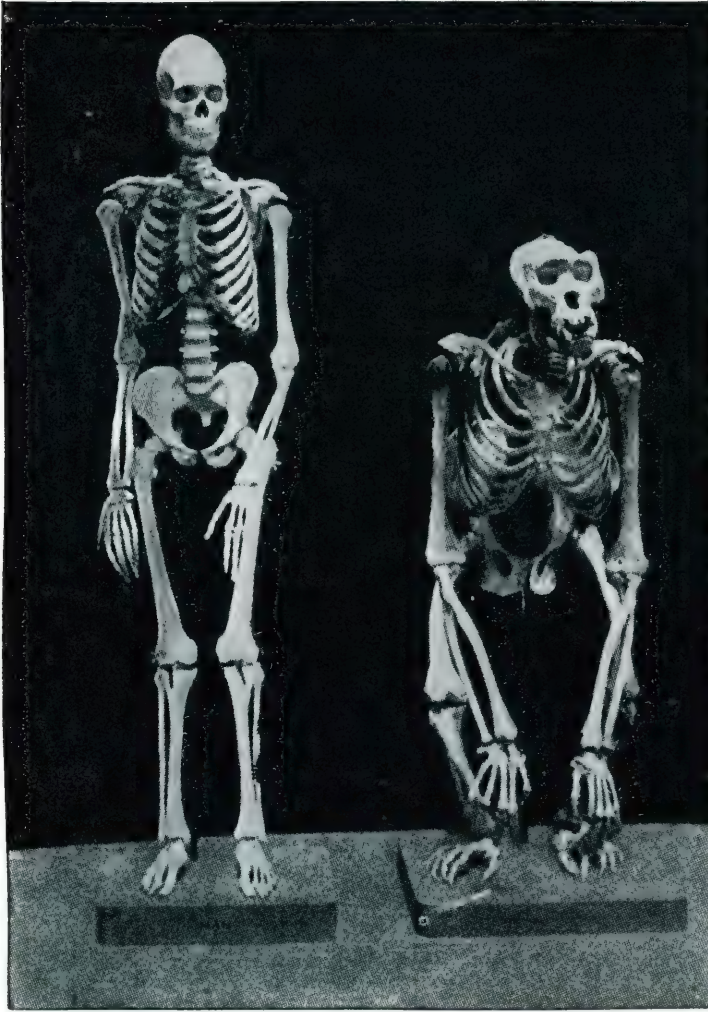


Photo: Gambier, Bolton

THE SKELETONS OF MAN AND GORILLA SHOWING THE CONTRAST OF THE UPRIGHT AND ARBOREAL TYPES OF LIMB AND BUILD.

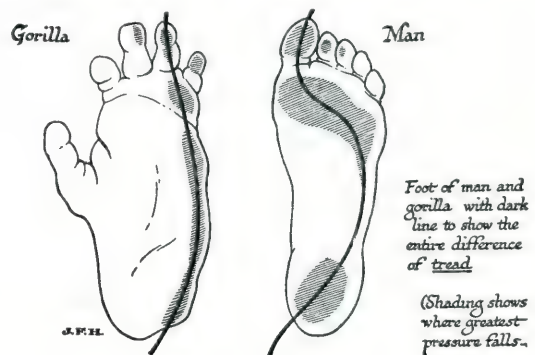
from the walking of man. They learnt to walk on their hindlegs at a different school, it would seem, and under different conditions from those under which man became erect. The walking habit of man may not be the same thing as the walking habit of the great apes; it may be a parallelism and not a common inheritance.

The great apes are forest dwellers; their walking even now is incidental; they are at their happiest among trees. But man walks so well and runs so swiftly as to suggest a very long ancestry upon the ground. Also, he does not climb well now; he climbs with caution and hesitation. His ancestors may have been running creatures for long ages. Moreover, it

is to be noted that he does not swim naturally; he has to learn to swim, and that seems to point to a long-standing separation from rivers and lakes and the sea. Almost certainly that ancestor was a smaller and slighter creature than its human descendants. Conceivably the human ancestor at the opening of the Cainozoic period was something rather like a running lemur, living chiefly on the ground, hiding among rocks rather than trees. It could still climb trees well and hold things between its great toe and its second toe (as the Japanese can to this day), but it was already coming down to the ground again from a still remoter, a Mesozoic arboreal ancestry. It is quite understandable that such a creature would very rarely die in water in such circumstances as to leave bones to become fossilized.

It must always be borne in mind that among its many other imperfections the Geological Record necessarily contains abundant traces only of water or marsh creatures or of creatures easily and frequently drowned. The same reasons that make any traces of the ancestors of the

mammals rare and relatively unprocurable in the Mesozoic rocks, probably make the traces of possible human ancestors rare and rela-

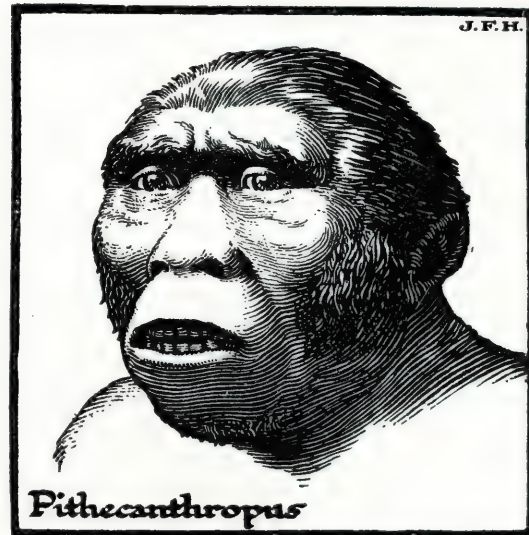


tively unprocurable in the Cainozoic rocks. Such knowledge as we have of the earliest men, for example, is almost entirely got from a few caves, into which they went and in which they left their traces. Until the hard Pleistocene times they lived and died in the open, and their bodies were consumed or decayed altogether.

But it is well to bear in mind also that the record of the rocks has still to be thoroughly examined. It has been studied only for a few generations, and by only a few men in each generation. Most men have been too busy making war, making profits out of their neighbours, toiling at work that machinery could do for them in a tenth of the time, or simply playing about, to give any attention to these more interesting things. There may be, there probably are, thousands of deposits still untouched containing countless fragments and vestiges of man and his progenitors. In Asia particularly, in India or the East Indies, there may be hidden the most illuminating clues. What we know to-day of early men is the merest scrap of what will presently be known.

The apes and monkeys already appear to have been differentiated at the beginning of the Cainozoic Age, and there are a number of Oligocene and Miocene apes whose relations to one another and to the human line have still to be made out. Among these we may mention *Dryopithecus* of the Miocene Age, with a very human-looking jaw. In the Siwalik Hills of northern India remains of some very interesting apes have been found, of which *Sivapithecus* and *Palaopithecus* were possibly related closely to the human ancestor. Possibly these animals already used implements. Charles Darwin represents baboons as opening nuts by breaking them with stones, using stakes to prize up rocks in the hunt for insects, and striking blows with sticks and stones.¹ The chimpanzee makes itself a sort of tree hut by intertwining branches. Stones apparently chipped for use have been found in strata of Oligocene Age at Boncelles in Belgium. Possibly the implement-using disposition was already present in that running lemuroid ancestry from which we are descended.

¹ Darwin's *Descent of Man*.



POSSIBLE APPEARANCE OF THE SUB-MAN
PITHECANTHROPUS.

The face, jaws, and teeth are mere guess-work (see text)

§ 2

Among the earliest evidences of some creature, either human or at least more man-like than any living ape upon earth, are a number of flints and stones very roughly chipped and shaped so as to be held in the hand. These were probably used as hand-axes. These early implements ("Eoliths") are often so crude and simple that there was for a long time a controversy whether they were to be regarded as natural or artificial productions.² The date of the earliest of them is put by geologists as Pliocene—that is to say, *before the First Glacial Age*. They occur also throughout the First Interglacial period. We know of no bones or other remains in Europe or America of the quasi-human beings of half a million years ago, who made and used these implements. They used them to hammer with, perhaps they used them to

² Among the earlier pioneers of the latter view was Mr. Harrison, a grocer of Ightham in Kent, one of those modest and devoted observers to whom British geology owes so much. At first his "Eoliths" were flouted and derided by archaeologists, but to-day he has the scientific world with him in the recognition of the quasi-human origin of many of his specimens. With him we must honour Mr. W. J. Lewis Abbott, a jeweller of St. Leonards, whose intimate knowledge of stone structure has been of the utmost value in these discussions. See "Occ. Papers," No. 4, of the Royal Anthropol. Inst., for a description by Sir E. R. Lankester of one of the better formed of these early implements.

fight with, and perhaps they used bits of wood for similar purposes.¹

But at Trinil, in Java, in strata which are said to correspond either to the latter Pliocene or to the American and European First Ice Age, there have been found some scattered bones of a creature, such as the makers of these early implements may have been. The top of a skull, some teeth, and a thigh-bone have been found. The skull shows a brain-case about half-way in size between that of the chimpanzee and man, but the thigh-bone is that of a creature as well adapted to standing and running as a man, and as free, therefore, to use its hands. The creature was not a man, nor was it an arboreal ape like the chimpanzee. It was a walking ape. It has been named by naturalists *Pithecanthropus erectus* (the walking ape-man). We cannot say that it is a direct human ancestor, but we may guess that the creatures who scattered these first stone tools over the world

must have been closely similar and kindred, and that our ancestor was a beast of like kind. This little trayful of bony fragments from Trinil is, at present, apart from stone implements, the oldest relic of early humanity, or of the close blood relations of early humanity, that is known.

While these early men or "sub-men" were running about Europe four or five hundred thousand years ago, there were mammoths, rhinoceroses, a huge hippopotamus, a giant beaver, and a bison and wild cattle in their world. There were also wild horses, and the sabre-toothed tiger still abounded, a creature with canine teeth so greatly developed that it could not have eaten meat after the fashion of a lion or tiger, its sabres must have prevented it from biting; it must have leapt upon its prey and hung on until its victim died from exhaustion, and then probably it sucked the blood. There are no traces of lions or tigers at that time in Europe, but there were bears, otters, wolves, and a wild boar. It may be that the early sub-man played jackal to the sabre-toothed tiger, and finished up the bodies the latter had done with.

¹ Some writers suppose that a Wood and Shell age preceded the earliest Stone Age. South Sea Islanders, Negroes, and Bushmen still make use of wood and the sharp-edged shells of land and water molluscs as implements.



A RHINOCEROS CONTEMPORARY WITH THE PRE-MEN.



THE MAMMOTH A CONTEMPORARY OF EARLY MAN.

§ 3

After this first glimpse of something at least sub-human in the record of geology, there is not another fragment of human or man-like bone yet known from that record for an interval of hundreds of thousands of years. It is not until we reach deposits which are stated to be of the Second Interglacial period, 200,000 years later, 200,000 or 250,000 years ago, that another little scrap of bone comes to hand. Then we find a jaw-bone.

This jaw-bone was found in a sandpit near Heidelberg, at a depth of eighty feet from the surface,¹ and it is not the jaw-bone of a man as we understand man, but it is man-like in every respect, except that it has absolutely no trace of a chin; it is more massive than a man's, and its narrowness behind could not, it is thought, have given the tongue sufficient play for articulate speech. It is not an ape's jaw-bone; the teeth are human. This jaw-bone has been variously named *Homo Heidelbergensis* and *Palæoanthropus Heidelbergensis*, according to the estimate formed of its humanity or sub-humanity by various authorities. It lived in

¹ Sollas' *Ancient Hunters*, p. 40.

a world not remotely unlike the world of the still earlier sub-man of the first implements; the deposits in which it is found show that there were elephants, horses, rhinoceroses, bison, a moose, and so forth with it in the world, but the sabre-toothed tiger was dying out and the lion was spreading over Europe. The instruments of this period (known as the Chellian period) are a very considerable advance upon those of the Pliocene Age.

§ 4

We must turn over the Record for, it may be, another 100,000 years for the next remains of anything human or sub-human. Then in the Third Interglacial period, which may have begun 100,000 years ago and lasted 50,000 years,² the smashed pieces of a whole skull turn up. After all the vast lapse of time between this and the remote First Glacial period, the human creature has learnt only very slight improvements upon the primitive stone tools; and the bony remains discovered at Piltdown in Sussex display a

² We follow Penck.

creature still ascending only very gradually from the sub-human.

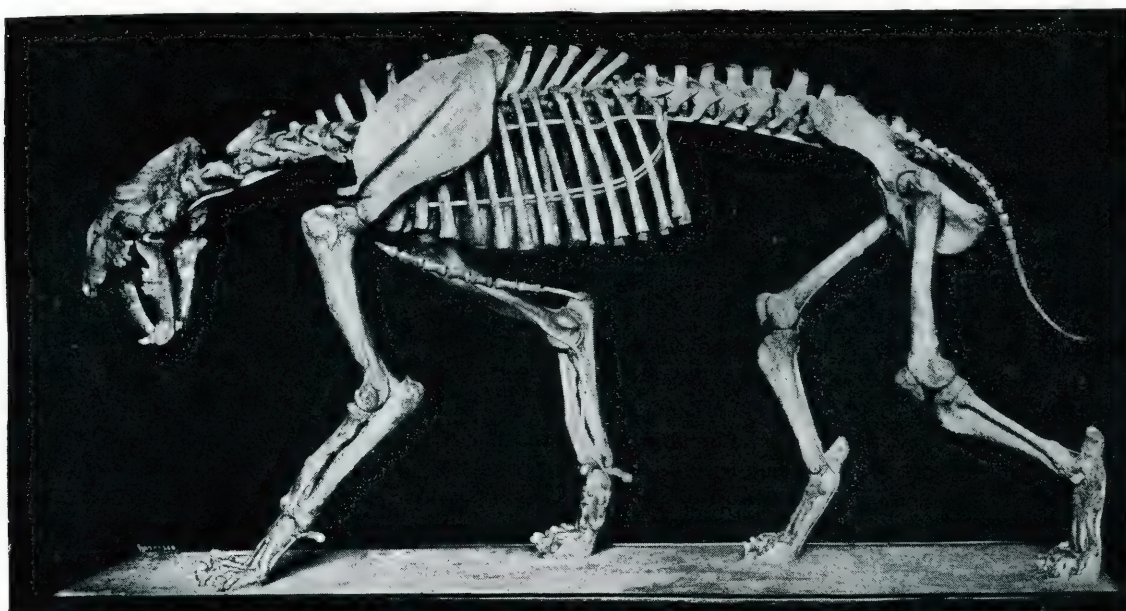
The first scraps of this skull were found in an excavation for road gravel in Sussex. Bit by bit other fragments of this skull were hunted out from the quarry heaps until most of it could be pieced together. It is a thick skull, thicker than that of any living race of men, and it has a brain capacity intermediate between that of Pithecanthropus and man. This creature has been named *Eoanthropus*, the dawn man. In the same gravel-pits were found teeth of rhinoceros, hippopotamus, and the leg-bone of a deer with marks upon it that may be cuts.

There was also a jaw-bone among these scattered remains, which was at first assumed naturally enough to belong to *Eoanthropus*, but which it was afterwards suggested was probably that of a chimpanzee. It is extraordinarily like that of a chimpanzee, but Dr. Keith, one of the greatest authorities in these questions, assigns it, after an exhaustive analysis in his *Antiquity of Man* (1915), to the skull with which it is found. It is, as a jaw-bone, far less human in character than the jaw of the much more ancient *Homo Heidelbergensis*, but the teeth are in some respects more like those of living men.

Dr. Keith, swayed by the jaw-bone, does not

think that *Eoanthropus*, in spite of its name, is a creature in the direct ancestry of man. Much less is it an intermediate form between the Heidelberg man and the Neanderthal man we shall presently describe. It was only related to the true ancestor of man as the orang is related to the chimpanzee. It was one of a number of sub-human running apes of more than ape-like intelligence, and if it was not on the line royal, it was at any rate a very close collateral.

After this glimpse of a skull, the Record for very many centuries gives nothing but flint implements, which improve steadily in quality. A very characteristic form is shaped like a sole, with one flat side stricken off at one blow and the other side worked. The archæologists, as the Record continues, are presently able to distinguish scrapers, borers, knives, darts, throwing stones, and the like. Progress is now more rapid; in a few centuries the shape of the hand-axe shows distinct and recognizable improvements. And then comes quite a number of remains. The Fourth Glacial Age is rising towards its maximum. Man is taking to caves and leaving vestiges there; at Krapina in Croatia, at Neanderthal near Düsseldorf, at Spy, human remains have been found, skulls and bones of a creature that is certainly



SKELETON OF THE SABRE TOOTHED TIGER, A CONTEMPORARY OF THE SUB-MEN, BUT NOT APPARENTLY OF THE EARLY TRUE MEN.

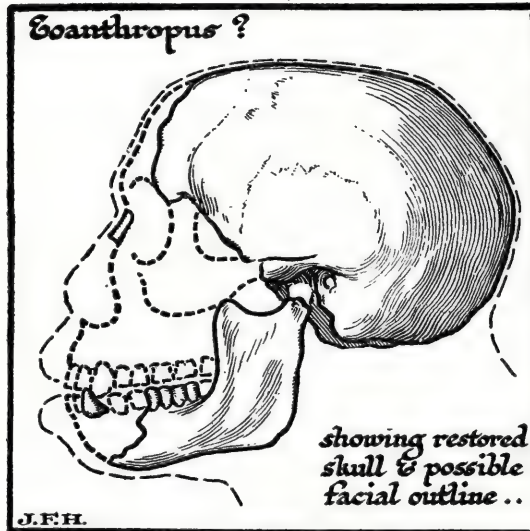


DIAGRAM TO ILLUSTRATE THE RIDDLE OF THE PILTDOWN SUB-MAN.

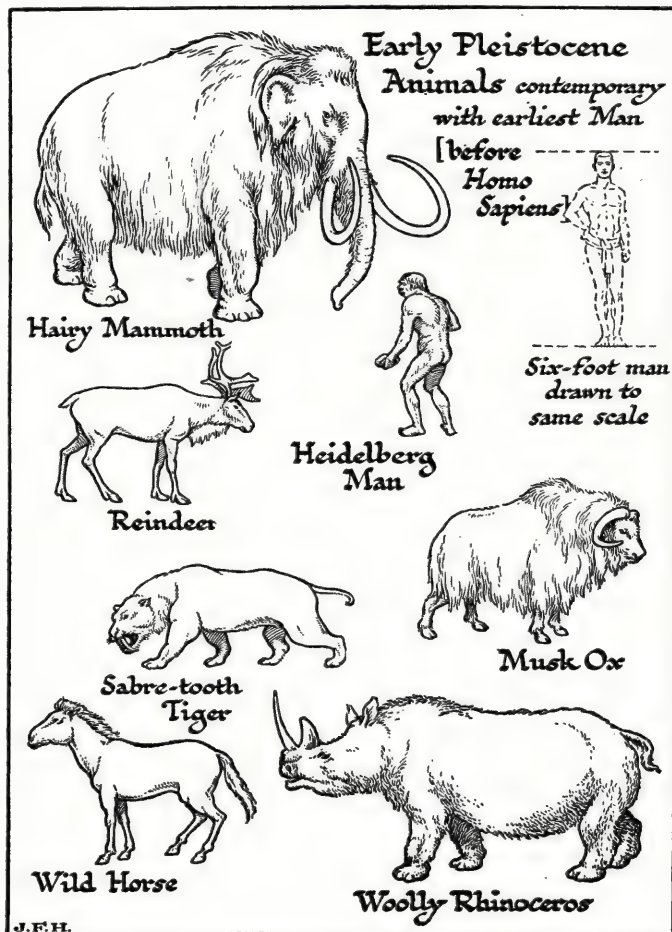
a man. Somewhere between 100,000 and 50,000 years ago, if not earlier, appeared *Homo Neanderthalensis* (also called *Homo antiquus* and *Homo primigenius*), a quite passable human being. His thumb was not quite equal in flexibility and usefulness to a human thumb, he stooped forward and could not hold his head erect, as all living men do, he was chinless and perhaps incapable of speech, there were curious differences about the enamel and the roots of his teeth from those of all living men, he was very thick-set, he was, indeed, not quite of the human species; but there is no dispute about his attribution to the genus *Homo*. He was certainly not descended from *Eoanthropus*, but his jaw-bone is so like the Heidelberg jaw-bone, as to make it possible that *Homo Heidelbergensis*, a thousand centuries before him, was of his blood and race.

§ 5

The Riddle of the Piltdown Remains. Upon this question of the Piltdown jaw-bone, it may be of interest to quote here a letter to the writer from Sir Ray Lankester, discussing

the question in a familiar and luminous manner. It will enable the reader to gauge the extent and quality of the evidence that we possess at present upon the nature of these early human and sub-human animals. Upon these fragile Piltdown fragments alone more than a hundred books, pamphlets, and papers have been written. They are guarded more carefully from theft and wilful damage than the most precious jewels, and in the museum cases one sees only carefully executed *fac-similes*.

"As to the Piltdown jaw-bone, the best study of it is that by Smith Woodward, who first described it and the canine found later. The jaw is imperfect in front, but has the broad, flat symphysis of the Apes. G. S. Miller, an American anthropologist, has made a very good comparison of it with a chimpanzee's jaw, and concludes that it is a chimpanzee's. (His latest paper is in the *Am. Jour. of Phys. Anthropol.* vol. i., no. 1.) The one point in the



Piltdown jaw itself against chimpanzee identification is the smooth, flat, worn surface of the molars. This is a *human* character, and is due to lateral movement of the jaw, and hence rubbing down of the tubercles of the molars. This is not worth much. But the serious question is, are we to associate this jaw with the cranium found close by it? If so, it is certainly not chimpanzee nor close to the Apes, but decidedly hominid. Two other small fragments of crania and a few more teeth have been found in the gravel two miles from Piltdown, which agree with the Piltdown cranium in having superciliary ridges fairly strong for a human skull, but not anything like the great superciliary ridges of Apes. The fact one has to face is this: here you have an imperfect cranium, very thick-walled and of small cubical contents (1,100 or so), but much larger in that respect than any ape's. A few yards distant from it in the same layer of gravel is found a jaw-bone having rather large pointed canines, a flat, broad symphysis, and other points about the inner face of the ramus and ridges which resemble those of the chimpanzee. Which is the more likely: (a) that these two novel fragments tending apewards from man were parts of the same individual; or (b), that the sweeping of the Wealden valley has brought there together a half-jaw and a broken cranium *both* more ape-like in character than any known human corresponding bits, and yet derived from two separate anthropoid beasts, one (the jaw) more simian, and the other (the cranium) much less so? As to the probabilities,

we must remember that this patch of gravel at Piltdown, clearly and definitely, is a wash-up of remains of various later tertiary and post-tertiary deposits. It contains fragments of Miocene mastodon and rhinoceros teeth. These latter differ entirely in mineral character from the *Eoanthropus* jaw and the cranium. But (and this needs re-examination and *chemical* analysis) the Piltdown jaw and the Piltdown cranium do not seem to me to be quite alike in their mineral condition. The jaw is more deeply iron-stained, and, I should say (but not confidently), harder than the cranium. Now, it is easy to attribute too much importance to that difference, since in a patch of iron-stained gravel, such as that at Piltdown, the soaking of water and iron salts into bones embedded may be much greater in one spot than in another only a yard off, or a few inches deeper!

"So I think we are stumped and baffled! The most prudent way is to keep the jaw and the cranium apart in all argument about them. On the other hand, on the principle that hypotheses are not to be multiplied beyond necessity, there is a case for regarding the two—jaw and cranium—as having been parts of one beast—or man."

To which Sir H. H. Johnston adds: "Against the chimpanzee hypothesis it must be borne in mind that so far no living chimpanzee or fossil chimpanzee-like remains have been found nearer England than north equatorial Africa or Northwest India, and no remains of great apes at all nearer than Southern France and the upper Rhine—and those widely different from the *Eoanthropus* jaw."

IX

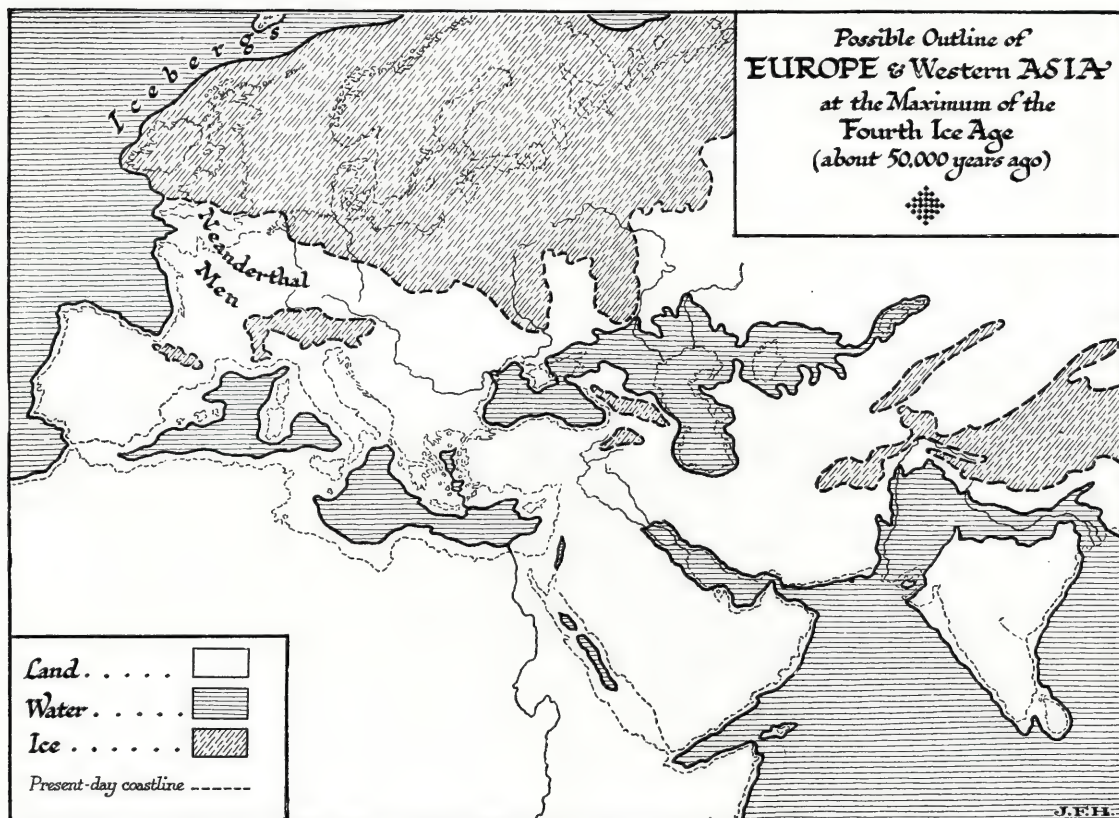
THE NEANDERTHAL MEN, AN EXTINCT RACE (The Early Palæolithic Age¹)

§ 1

IN the time of the Third Interglacial period the outline of Europe and western Asia was very different from what it is to-day. Vast areas to the west and north-west which are now under the Atlantic waters were then dry land; the Irish sea and the North Sea were river valleys. Over these northern areas

there spread and receded and spread again a

¹ Three phases of human history before the knowledge and use of metals are often distinguished. First there is the so-called Eolithic Age (dawn of stone implements), then the Palæolithic Age (old stone implements), and finally an age in which the implements are skilfully made and frequently well finished and polished (Neolithic Age). The Palæolithic Period is further divided into an earlier (sub-human) and a later (fully human) period. We shall comment on these divisions later.



THIS MAP REPRESENTS THE PRESENT STATE OF OUR KNOWLEDGE OF THE GEOGRAPHY OF EUROPE AND WESTERN ASIA AT A PERIOD WHICH WE GUESS TO BE ABOUT 50,000 YEARS AGO.

Much of this map is of course speculative, but its broad outlines must be fairly like those of the world in which men first became men.

great ice cap such as covers central Greenland to-day (see Map, herewith). This vast ice cap, which covered both polar regions of the earth, withdrew huge masses of water from the ocean, and the sea-level consequently fell, exposing great areas of land that are now submerged again. The Mediterranean area was probably a great valley below the general sea-level, containing two inland seas cut off from the general ocean. The climate of this Mediterranean basin was perhaps cold temperate, and the region of the Sahara to the south was not then a desert of baked rock and blown sand, but a well-watered and fertile country. Between the ice sheets to the north and the Alps and Mediterranean valley to the south stretched a bleak wilderness whose climate changed from harshness to a mild kindness and then hardened again for the Fourth Glacial Age.

Across this wilderness, which is now the great plain of Europe, wandered a various fauna. At first there were hippopotami,

rhinoceroses, mammoths, and elephants. The sabre-toothed tiger was diminishing towards extinction. Then, as the air chilled, the hippopotamus, and then other warmth-loving creatures, ceased to come so far north, and the sabre-toothed tiger disappeared altogether. The woolly mammoth, the woolly rhinoceros, the musk ox, the bison, the aurochs, and the reindeer became prevalent, and the temperate vegetation gave place to plants of a more arctic type. The glaciers spread southward to the maximum of the Fourth Glacial Age (about 50,000 years ago), and then receded again. In the earlier phase, the Third Interglacial period, a certain number of small family groups of men (*Homo Neanderthalensis*) and probably of sub-men (*Eoanthropus*) wandered over the land, leaving nothing but their flint implements to witness to their presence. They probably used a multitude and variety of wooden implements also; they had probably learnt much about the shapes of objects and the use of

different shapes from wood, knowledge which they afterwards applied to stone; but none of this wooden material has survived; we can only speculate about its forms and uses. As the weather hardened to its maximum of severity, the Neanderthal men, already it would seem acquainted with the use of fire, began to seek shelter under rock ledges and in caves—and so leave remains behind them. Hitherto they had been accustomed to squat in the open

driven out of the caves and kept out of the caves in which these early men wanted to squat and hide; and no doubt fire was an effective method of eviction and protection. Probably early men did not go deeply into the caves, because they had no means of lighting their recesses. They got in far enough to be out of the weather, and stored wood and food in odd corners. Perhaps they barricaded the cave mouths. Their only available light for going deeply into the caverns would be torches.

What did these Neanderthal men hunt? Their only possible weapons for killing such giant creatures as the mammoth or the cave bear, or even the reindeer, were spears of wood, wooden clubs, and those big pieces of flint they left behind them, the Chellian and Moustierian implements; and probably their usual quarry was smaller game. But they did certainly eat the flesh of the big beasts when they had a chance, and perhaps they followed them when sick or when wounded by combats, or took advantage of them when they were bogged or in trouble with ice or water. (The Labrador Indians still kill the caribou with spears at awkward river crossings.) At Dewlish, in Dorset, an artificial trench has been found which is supposed to have been a Palæolithic trap for elephants.¹ We know that the Neanderthals partly ate their kill where it fell; but they brought back the big marrow bones to the cave to crack and eat at leisure, because few ribs and vertebræ are found in the caves, but great quantities of cracked and split long bones. They used skins to wrap about them, and the women probably dressed the skins.

We know also that they were right-handed like modern men, because the left side of the brain (which serves the right side of the body) is bigger than the right. But while the back parts of the brain which deal with sight and

¹ Osmond Fisher, quoted in Wright's *Quaternary Ice Age*.



A GUESS AT THE APPEARANCE OF *HOMO NEANDERTHALENSIS*.

about the fire, and near their water supply. But they were sufficiently intelligent to adapt themselves to the new and harder conditions. (As for the sub-men, they seem to have succumbed to the stresses of this Fourth Glacial Age altogether. At any rate, the rudest type of Palæolithic implements presently disappears.)

Not merely man was taking to the caves. This period also had a cave lion, a cave bear, and a cave hyæna. These creatures had to be



OUR NEANDERTHALOID ANCESTOR (NOT A NEANDERTHAL MAN, BUT A
PARALLEL SPECIES)

touch and the energy of the body are well developed, the front parts, which are connected with thought and speech, are comparatively small. It was as big a brain as ours, but different. This species of *Homo* had certainly a very different mentality from ours; its individuals were not merely simpler and lower than we are, they were on another line. It may be they did not speak at all, or very sparingly. They had nothing that we should call a language.

§ 2

In Worthington Smith's *Man the Primeval Savage* there is a very vividly written description of early Palæolithic life, from which much of the following account is borrowed. In the original, Mr. Worthington Smith assumes a more extensive social life, a larger community, and a more definite division of labour among its members than is altogether justifiable in the face of such subsequent writings as J. J. Atkinson's memorable essay on Primal Law.¹ For the little tribe Mr. Worthington Smith described, there has been substituted, therefore, a family group under the leadership of one Old Man, and the suggestions of Mr. Atkinson as to the behaviour of the Old Man have been worked into the sketch.

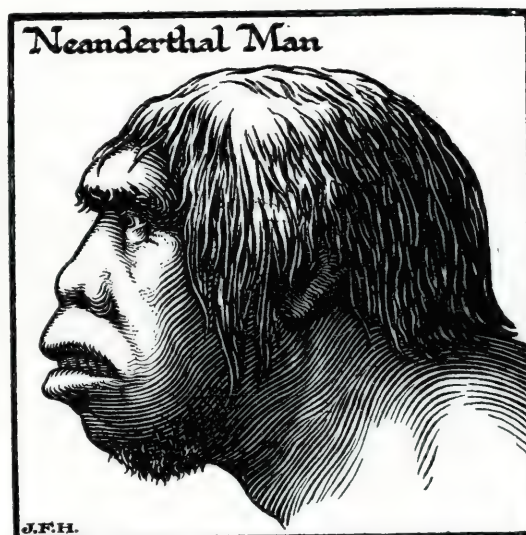
Mr. Worthington Smith describes a squatting-place near a stream, because primitive man, having no pots or other vessels, must needs have kept close to a water supply, and with some chalk cliffs adjacent from which flints could be got to work. The air was bleak, and the fire was of great importance, because fires once out were not easily relit in those days. When not required to blaze it was probably banked down with ashes. The most probable way in which fires were started was by hacking a bit of iron pyrites with a flint amidst dry dead leaves; concretions of iron pyrites and flints are found together in England where the gault and chalk approach each other.² The little group of people would be squatting about amidst a litter of fern, moss, and such-like dry material.

¹ *Social Origins*, by Andrew Lang, and *Primal Law*, by J. J. Atkinson. (Longmans, 1903.)

² This first origin of fire was suggested by Sir John Lubbock (*Prehistoric Times*), and Ludwig Hopf, in *The Human Species*, says that "Flints and pieces of pyrites are found in close proximity in palæolithic settlements near the remains of mammoths."

Some of the women and children would need to be continually gathering fuel to keep up the fires. It would be a tradition that had grown up. The young would imitate their elders in this task. Perhaps there would be rude wind shelters of boughs on one side of the encampment.

The Old Man, the father and master of the group, would perhaps be engaged in hammering

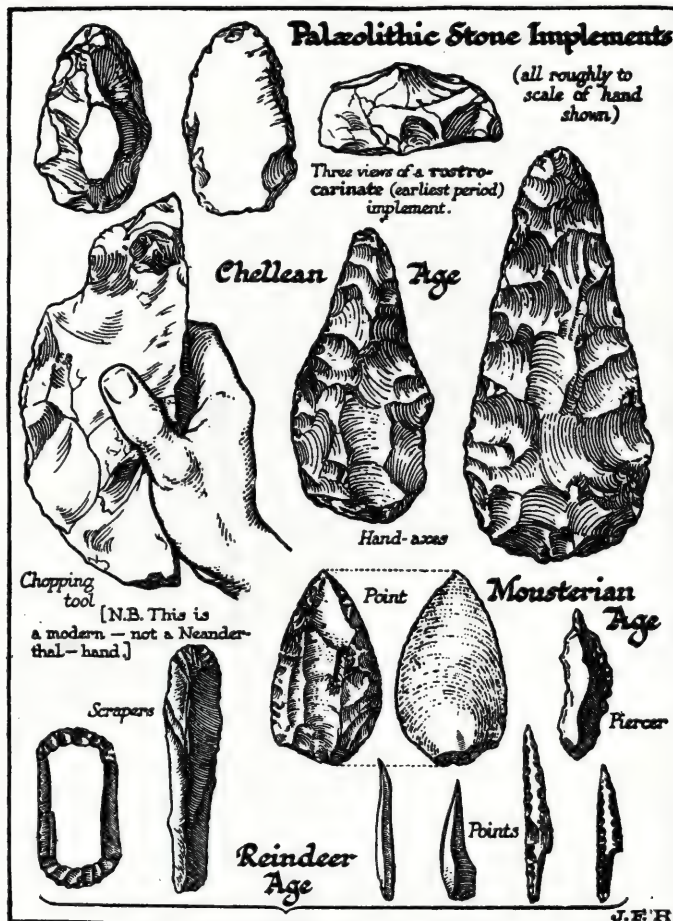


ANOTHER ESSAY IN THE RESTORATION OF
HOMO NEANDERTHALENSIS.

flints beside the fire. The children would imitate him and learn to use the sharpened fragments. Probably some of the women would hunt good flints; they would fish them out of the chalk with sticks and bring them to the squatting-place.

There would be skins about. It seems probable that at a very early time primitive men took to using skins. Probably they were wrapped about the children, and used to lie upon when the ground was damp and cold. A woman would perhaps be preparing a skin. The inside of the skin would be well scraped free of superfluous flesh with trimmed flints, and then strained and pulled and pegged out flat on the grass, and dried in the rays of the sun.

Away from the fire other members of the family group prowl in search of food, but at night they all gather closely round the fire and build it up, for it is their protection against the wandering bear and such-like beasts of prey. The Old



EARLY STONE IMPLEMENTS.

The Mousterian Age implements, and all above it, are those of Neanderthal men or, possibly in the case of the rostricarinates, of sub-men. The lower row (Reindeer Age) are the work of true men. The student should compare this diagram with the time diagram attached to Chapter VII, § 6.

Man is the only fully adult male in the little group. There are women, boys and girls, but so soon as the boys are big enough to rouse the Old Man's jealousy, he will fall foul of them and either drive them off or kill them. Some girls may perhaps go off with these exiles, or two or three of these youths may keep together for a time, wandering until they come upon some other group, from which they may try to steal a mate. Then they would probably fall out among themselves. Some day, when he is forty years old perhaps or even older, and his teeth are worn down and his energy abating, some younger male will stand up to the old man and kill him and reign in his stead. There is probably short shrift for the old at the squatting-place. So soon as they grow weak and bad-tempered, trouble and death come upon them.

What did they eat at the squatting-place?

"Primeval man is commonly described as a hunter of the great hairy mammoth, of the bear, and the lion, but it is in the highest degree improbable that the human savage ever hunted animals much larger than the hare, the rabbit, and the rat. Man was probably the hunted rather than the hunter.

"The primeval savage was both herbivorous and carnivorous. He had for food hazel-nuts, beech-nuts, sweet chestnuts, earth-nuts, and acorns. He had crab-apples, wild pears, wild cherries, wild gooseberries, bullaces, sorbs, sloes, blackberries, yewberries, hips and haws, watercress, fungi, the larger and softer leaf-buds, Nostoc (the vegetable substance called 'fallen stars' by countryfolk), the fleshy, juicy, asparagus-like rhizomes or subterranean stems of the *Labiata* and like plants, as well as other delicacies of the vegetable kingdom. He had birds' eggs, young birds, and the honey and honeycomb of wild bees. He had newts, snails, and frogs—the two latter delicacies are still highly esteemed in Normandy and Brittany. He had fish, dead and alive,

and fresh-water mussels; he could easily catch fish with his hands and paddle and dive for and trap them. By the seaside he would have fish, mollusca, and seaweed. He would have many of the larger birds and smaller mammals, which he could easily secure by throwing stones and sticks, or by setting simple snares. He would have the snake, the slow-worm, and the crayfish. He would have various grubs and insects, the large larvæ of beetles and various caterpillars. The taste for caterpillars still survives in China, where they are sold in dried bundles in the markets. A chief and highly nourishing object of food would doubtlessly be bones smashed up into a stiff and gritty paste.

"A fact of great importance is this—primeval man would not be particular about having his

flesh food over-fresh. He would constantly find it in a dead state, and, if semi-putrid, he would relish it none the less—the taste for high or half-putrid game still survives. If driven by hunger and hard pressed, he would perhaps sometimes eat his weaker companions or unhealthy children who happened to be feeble or unsightly or burthensome. The larger animals in a weak and dying state would no doubt be much sought for; when these were not forthcoming, dead and half-rotten examples would be made to suffice. An unpleasant odour would not be objected to; it is not objected to now in many continental hotels.

"The savages sat huddled close together round their fire, with fruits, bones, and half-putrid flesh. We can imagine the old man and his women twitching the skin of their shoulders, brows, and muzzles as they were annoyed or bitten by flies or other insects. We can imagine the large human nostrils, indicative of keen scent, giving rapidly repeated sniffs at the foul meat before it was consumed; the bad odour of the meat, and the various other disgusting odours belonging to a haunt of savages, being not in the least disapproved.

"Man at that time was not a *degraded* animal, for he had never been higher; he was therefore an exalted animal, and, low as we esteem him now, he yet represented the highest stage of development of the animal kingdom of his time."

That is at least an acceptable sketch of a Neanderthal squatting-place. But before extinction overtook them, even the Neanderthals learnt much and went far.

Whatever the older Palæolithic men did with their dead, there is reason to suppose that the later *Homo Neanderthalensis* buried some individuals at least with respect and ceremony. One of the best-known Neanderthal skeletons is that of a youth who apparently had been deliberately interred. He had been placed in a sleeping posture, head on the right forearm. The head lay on a number of flint fragments carefully piled together "pillow fashion." A big hand-axe lay near his head, and around him were numerous charred and split ox bones, as though there had been a feast or an offering.

To this appearance of burial during the later Neanderthal age we shall return later, when we are considering the ideas that were inside the heads of primitive men.

This sort of men may have wandered, squatted about their fires, and died in Europe for a period extending over 100,000 years, if we assume, that is, that the Heidelberg jaw-bone belongs to a member of the species, a period so vast that all the subsequent history of our race becomes a thing of yesterday. Along its own line this species of men was accumulating a dim tradition, and working out its limited



possibilities. Its thick skull imprisoned its brain, and to the end it was low-browed and brutish.

§ 3

When the Dutch discovered Tasmania, they found a detached human race not very greatly advanced beyond this Lower Palæolithic stage. But over most of the world the Lower Palæolithic culture had developed into a more complicated and higher life twenty or thirty thousand years ago. The Tasmanians were not racially Neanderthals;¹ their brain-cases, their neck-bones their jaws and teeth, show that; they had no

The Last Palæolithic Men.

¹ But compare Sollas' *Ancient Hunters*.

Neanderthal affinities; they were of the same species as ourselves. There can be little doubt that throughout the hundreds of centuries during which the scattered little groups of Neanderthal men were all that represented men in Europe, real men, of our own species, in some other part of the world, were working their way along parallel lines from much the same stage as the Neanderthalers ended at, and which the Tasmanians preserved, to a higher level of power and achievement. The Tas-

manians, living under unstimulating conditions, remote from any other human competition or example, lagged behind the rest of the human brotherhood.¹

About 200 centuries ago or earlier, real men of our own species, if not of our own race, came drifting into the European area.

¹ What is known of the Tasmanian Old Stone men is to be found in Roth and Butler's *Aborigines of Tasmania*. See also footnote on the Tasmanian language to Chapter XIII.

X

THE LATER POSTGLACIAL PALÆOLITHIC MEN, THE FIRST TRUE MEN (Later Palæolithic Age)

§ I

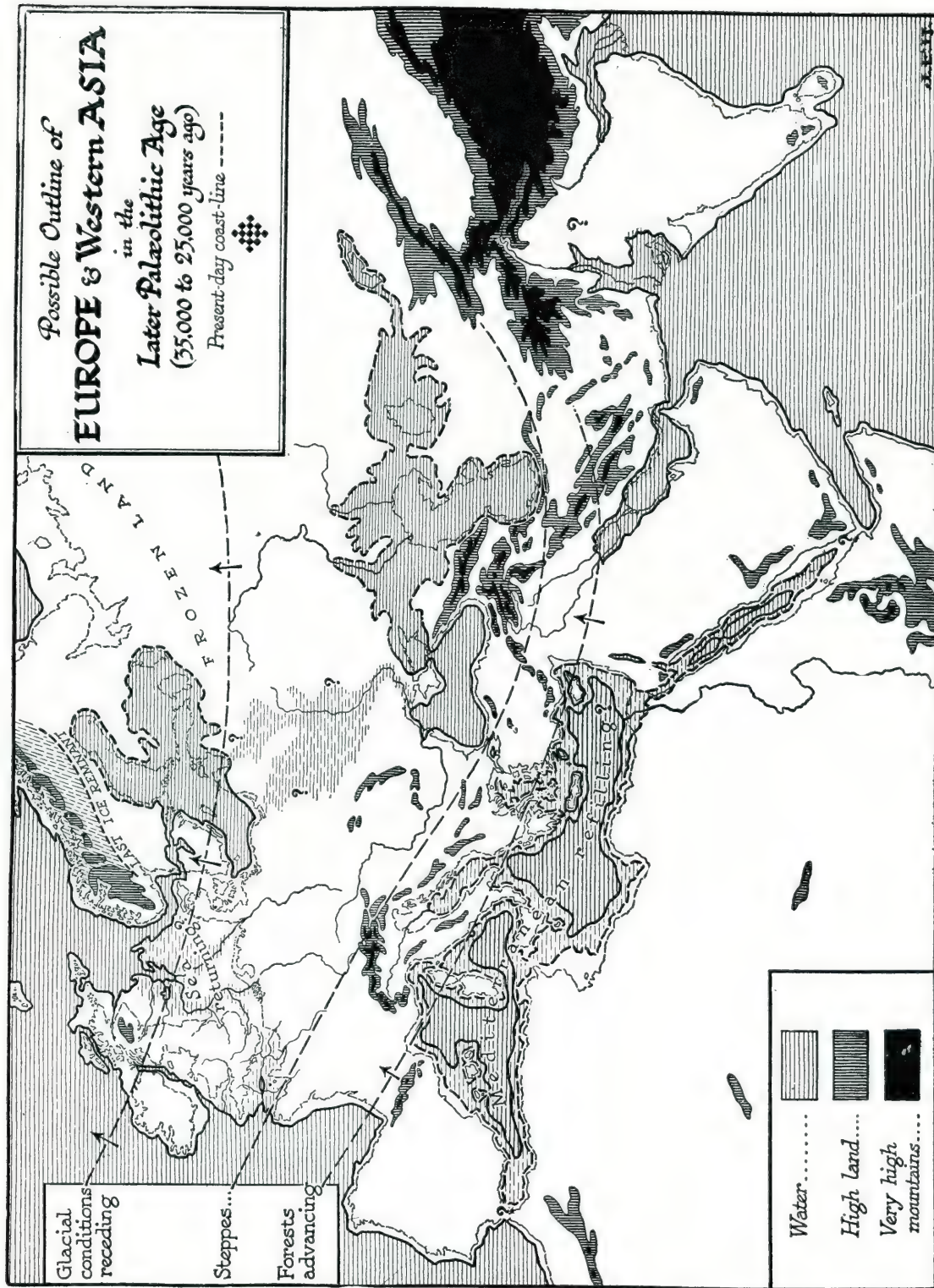
THE Neanderthal type of man prevailed in Europe at least for tens of thousands of years. For ages that make all history seem a thing of yesterday, these nearly human creatures prevailed.

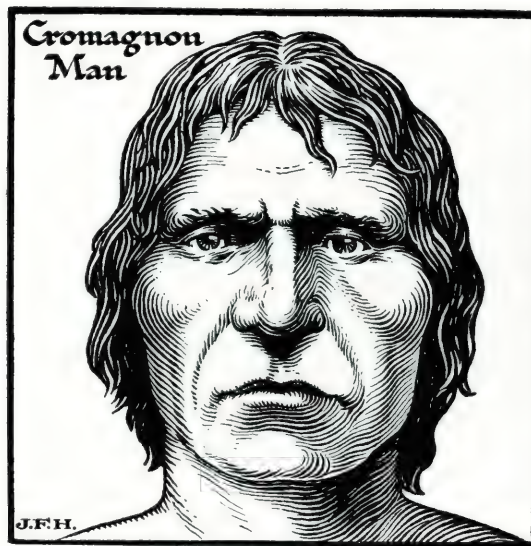
The coming of Men like Ourselves. If the Heidelberg jaw was that of a Neanderthaler, and if there is no error in the estimate of the age of that jaw, then the Neanderthal Race lasted out for more than 200,000 years! Finally, between 40,000 and 25,000 years ago, as the Fourth Glacial Age softened towards more temperate conditions (see Map on p. 53), a different human type came upon the scene, and, it would seem, exterminated *Homo Neanderthalensis*.² This new

type was probably developed in South Asia or North Africa, or in lands now submerged in the Mediterranean basin, and, as more remains are collected and evidence accumulates, men will learn more of their early stages. At present we can only guess where and how, through the slow ages, parallel with the Neanderthal cousin, these first *true men* arose out of some more ape-like progenitor. For hundreds of centuries they were acquiring skill of hand and limb, and power and bulk of brain, in that still unknown environment. They were already far above the Neanderthal level of achievement and intelligence, when first they come into our ken, and they had already split into two or more very distinctive races.

² The opinion that the Neanderthal race (*Homo Neanderthalensis*) is an extinct species which did not interbreed with the true men (*Homo sapiens*) is held by Professor Osborne, and it is the view to which the writer inclines and to which he has pointed in the treatment of this section; but it is only fair to the reader to note that many writers do not share this view. They write and speak of living "Neanderthalers" in contemporary populations. One observer has written in the past of such types in the west of Ireland; another has observed them in Greece. These so-called "living Neanderthalers" have neither the peculiarities of neck, thumb, nor teeth that distinguish the Neanderthal race of pre-men. The cheek teeth of true men, for instance, have what we call fangs, long fangs; the Neanderthaler's cheek tooth is a *more complicated and specialized* cheek tooth, a long tooth with short fangs, and his canine teeth were *less* marked,

less like dog-teeth, than ours. Nothing could show more clearly that he was on a different line of development. We must remember that so far only Western Europe has been properly explored for Palæolithic remains, and that practically all we know of the Neanderthal species comes from that area (see Map, p. 47). No doubt the ancestor of *Homo sapiens* (which species includes the Tasmanians) was a very similar and parallel creature to *Homo Neanderthalensis*. And we are not so far from that ancestor as to have eliminated not indeed "Neanderthal," but "Neanderthaloid" types. The existence of such types no more proves that the Neanderthal species, the makers of the Chellian and Mousterian implements, interbred with *Homo sapiens* in the European area than do monkey-faced people testify to an interbreeding with monkeys; or people with faces like horses, that there is an equine strain in our population.





These new-comers did not migrate into Europe in the strict sense of the word, but rather, as century by century the climate ameliorated, they followed the food and plants to which they were accustomed, as those spread into the new realms that opened to them. The ice was receding, vegetation was increasing, big game of all sorts was becoming more abundant. Steppe-like conditions, conditions of pasture and shrub, were bringing with them vast herds of wild horse. Ethnologists (students of race) class these new human races in one same species as ourselves, and with all human races subsequent to them, under one common specific name of *Homo Sapiens*. They had quite human brain-cases and hands. Their teeth and their necks were anatomically as ours are.

Now, here again, with every desire to be plain and explicit with the reader, we have still to trouble him with qualified statements and notes of interrogation. There is now an enormous literature about these earliest true men, the men of the Later Palæozoic Age, and it is still for the general reader a very confusing literature indeed. It is confusing because it is still confused at the source. We know of two distinct sorts of skeletal remains in this period, the first of these known as the Cro-Magnon race, and the second the Grimaldi race; but the great bulk of the human traces and appliances we find are either without human bones or with insufficient bones for us to define their associated physical type. There may have

been many more distinct races than these two. There may have been intermediate types. In the grotto of Cro-Magnon it was that complete skeletons of one main type of these Newer Palæolithic men, these true men, were first found, and so it is that they are spoken of as Cro-Magnards.

These Cro-Magnards were a tall people with very broad faces, prominent noses, and, all things considered, astonishingly big brains. The brain capacity of the woman in the Cro-Magnon cave exceeded that of the average male to-day. Her head had been smashed by a heavy blow. There were also in the same cave with her the complete skeleton of an older man, nearly six feet high, the fragments of a child's skeleton, and the skeletons of two young men. There were also flint implements and perforated sea-shells, used no doubt as ornaments. Such is one sample of the earliest true men. But at the Grimaldi cave, near Mentone, were discovered two skeletons also of the later Palæolithic Period, but of a widely contrasted type, with negroid characteristics that point rather to the negroid type. There can be no doubt that we have to deal in this period with at least two and probably more highly divergent races of true men. They may have overlapped in time, or Cro-Magnards may have followed the Grimaldi race, and either or both may have been contemporaries with the late Neanderthal men. Various authorities have very strong opinions upon these points, but they are, at most, opinions. The whole story is further fogged at present by our inability to distinguish, in the absence of skeletons, which race has been at work in any particular case. In what follows the reader will ask of this or that particular statement, "Yes, but is this the Cro-Magnard or the Grimaldi man or some other that you are writing about?" To which in most cases the honest answer is, "As yet we do not know." Confessedly our account of the newer Palæolithic is a jumbled account. There are probably two or three concurrent and only roughly similar histories of these newer Palæolithic men as yet, inextricably mixed up together. Some authorities appear to favour the Cro-Magnards unduly and to dismiss the Grimaldi people with as little as possible of the record.

The appearance of these truly human Post

glacial Palæolithic peoples was certainly an enormous leap forward in the history of mankind. Both of these main races had a human fore-brain, a human hand, an intelligence very like our own. They dispossessed *Homo Neanderthalensis* from his caverns and his stone quarries. And they agreed with modern ethnologists, it would seem, in regarding him as a different species. Unlike most savage conquerors, who take the women of the defeated side for their own and interbreed with them, it would seem that the true men would have nothing to do with the Neanderthal race, women or men. There is no trace of any intermixture between the races, in spite of the fact that the newcomers, being also flint users, were establishing themselves in the very same spots that their predecessors had occupied. We know very little of the appearance of the Neanderthal man, but this absence of intermixture seems to suggest an extreme hairiness, an ugliness, or a repulsive strangeness in his appearance over and above his low forehead, his beetle brows, his ape neck, and his inferior stature. Or he—and she—may have been too fierce to tame. Says Sir Harry Johnston, in a survey of the rise of modern man in his *Views and Reviews*: “The dim racial remembrance of such gorilla-like monsters, with cunning brains, shambling gait, hairy bodies, strong teeth, and possibly cannibalistic tendencies, may be the germ of the ogre in folklore. . . .”

These true men of the Palæolithic Age, who replace the Neanderthals, were coming into a milder climate, and although they used the caves and shelters of their predecessors, they lived largely in the open. They were hunting peoples, and some or all of them appear to have hunted the mammoth and the wild horse as well as the reindeer, bison, and aurochs. They ate much horse. At a great open-air camp at Solutr , where they seem to have had annual gatherings for many centuries, it is estimated that there are the bones of 100,000 horses, besides reindeer, mammoth, and bison bones. They probably followed herds of horses, the little bearded ponies of that age, as these moved after pasture. They hung about on the flanks of the herd, and became very wise about its habits and dispositions. A large part of these men's lives must have been spent in watching animals.

Whether they tamed and domesticated the horse is still an open question. Perhaps they learnt to do so by degrees as the centuries passed. At any rate, we find late Pal olithic drawings of horses with marks about the heads that are strongly suggestive of bridles, and there exists a carving of a horse's head showing what is perhaps a rope of twisted skin or tendon. But even if they tamed the horse, it is still more doubtful whether they rode it or had much use for it when it was tamed. The horse they knew was a wild pony with a beard under its chin, not up to carrying a man for any distance. It is improbable that these men had yet learnt the rather unnatural use of animal's milk as food. If they tamed the horse at last, it was the only animal they seem to have tamed. They had no dogs, and they had little to do with any sort of domesticated sheep or cattle.

It greatly aids us to realize their common humanity that these earliest true men could draw. Both races, it would seem, drew astonishingly well. They were by all standards savages, but they were artistic savages. They drew better than any of their successors down to the beginnings of history. They drew and painted on the cliffs and cave walls that they had wrested from the Neanderthal men. And the surviving drawings come to the ethnologist, puzzling over bones and scraps, with the effect of a plain message shining through guesswork and darkness. They drew on bones and antlers; they carved little figures.

These later Pal olithic people not only drew remarkably well for our information, and with an increasing skill as the centuries passed, but they have also left us other information about their lives in their graves. They buried. They buried their dead, often with ornaments, weapons, and food; they used a lot of colour in the burial, and evidently painted the body. From that one may infer that they painted their bodies during life. Paint was a big fact in their lives. They were inveterate painters; they used black, brown, red, yellow, and white pigments, and the pigments they used endure to this day in the caves of France and Spain. Of all modern races, none have shown so pictorial a disposition; the nearest approach to it has been among the American Indians.

These drawings and paintings of the later

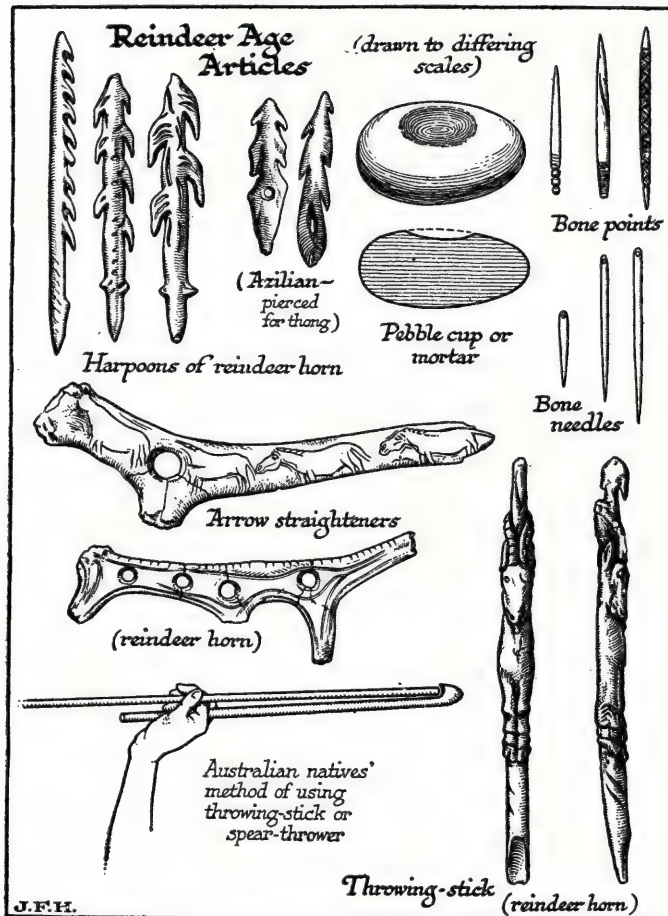
Palæolithic people went on through a long period of time, and present wide fluctuations in artistic merit. We give here some early sketches, from which we learn of the interest taken by these early men in the bison, horse, ibex, cave bear, and reindeer. In its early stages the drawing is often primitive like the drawings of clever children; quadrupeds are usually drawn with one hindleg and one foreleg, as children draw them to this day. The legs on

vivid and like. At the crest of their artistic time, eighteen or twenty thousand years ago, there were Palæolithic men who could draw as well as most modern European artists. They rarely drew themselves. The vast majority of their drawings represent animals. The mammoth and the horse are among the commonest themes. Some of the people, whether Grimaldi people or Cro-Magnon people, also made little ivory and soapstone statuettes, and among these

are some very fat female figures. These latter suggest the physique of Grimaldi rather than of Cro-Magnon artists. They are like Bushmen women. The human sculpture of the earlier times inclined to caricature, and generally such human figures as they represent are far below the animal studies in vigour and veracity.

Later on there was more grace and less coarseness in the human representations. One little ivory head discovered is that of a girl with an elaborate coiffure. These people at a later stage also scratched and engraved designs on ivory and bone. Some of the most interesting groups of figures are carved very curiously round bone, and especially round rods of deer bone, so that it is impossible to see the entire design altogether. Figures have also been found modelled in clay, although no Palæolithic people made any use of pottery.

Many of the paintings are found in the depths of unlit caves. They are often difficult of access. The artists must have employed lamps



the other side were too much for the artist's technique. Possibly the first drawings began as children's drawings begin, out of idle scratchings. The savage scratched with a flint on a smooth rock surface, and was reminded of some line or gesture. But their solid carvings are at least as old as their first pictures. The earlier drawings betray a complete incapacity to group animals. As the centuries progressed, more skilful artists appeared. The representation of beasts became at last astonishingly

to do their work, and shallow soapstone lamps in which fat could have been burnt have been found. Whether the seeing of these cavern paintings was in some way ceremonial or under what circumstances they were seen, we are now altogether at a loss to imagine.

§ 2

Archæologists distinguish at present three chief stages in the history of these newer Palæolithic men, and we must name these stages

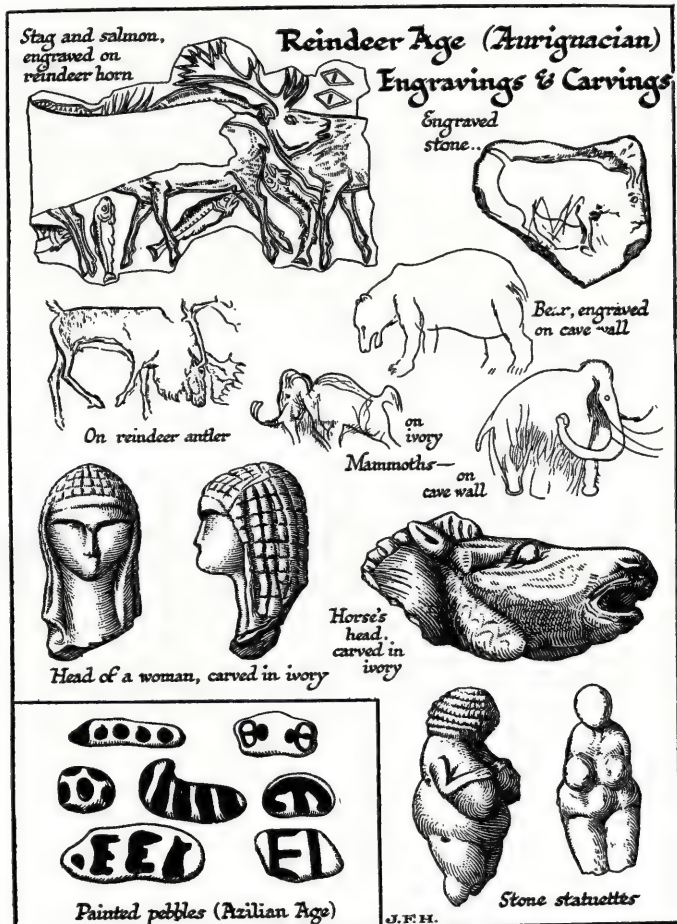
here. But it may be as well to note at the same time that it is a matter of the utmost difficulty to distinguish which of two Subdivisions of the Later Palæolithic deposits in different places is the older or newer. We may very well be dealing with the work of more or less contemporary and different races when we think we are dealing with successive ones. We are dealing, the reader must bear in mind, with little disconnected patches of material, a few score altogether. The earliest stage

usually distinguished by the experts is the *Aurignacean*; it is characterized by very well-made flint instruments, and by a rapid development of art and more particularly of statuettes and wall paintings. The most esteemed of the painted caves is ascribed to the latter part of this the first of the three subdivisions of the newer Palæolithic. The second subdivision of this period is called the *Solutrian*, and is distinguished particularly by the quality and beauty of its stone implements; some of its razor-like blades are only equalled and not surpassed by the very best of the Neolithic work. They are of course unpolished, but the best specimens are as thin as steel blades and almost as sharp. Finally, it would seem, came the *Magdalenian* stage, in which the horse and reindeer were dwindling in numbers and the red deer coming into Europe.¹ The stone implements are smaller, and there is a great quantity of bone harpoons, spearheads, needles, and the like. The hunters of the third and last stage of the later Palæolithic Age appear to have supplemented the diminishing food supply by fishing. The characteristic art of the period consists of deep reliefs done upon bone and line engraving upon bone. It is to this period that the designs drawn round bones belong, and it has been suggested that these designs upon round bones were used to print

¹ So Osborn in his *Men of the Old Stone Age*. But see Wright's *Quaternary Ice Age* for a different view of the Magdalenian Age.

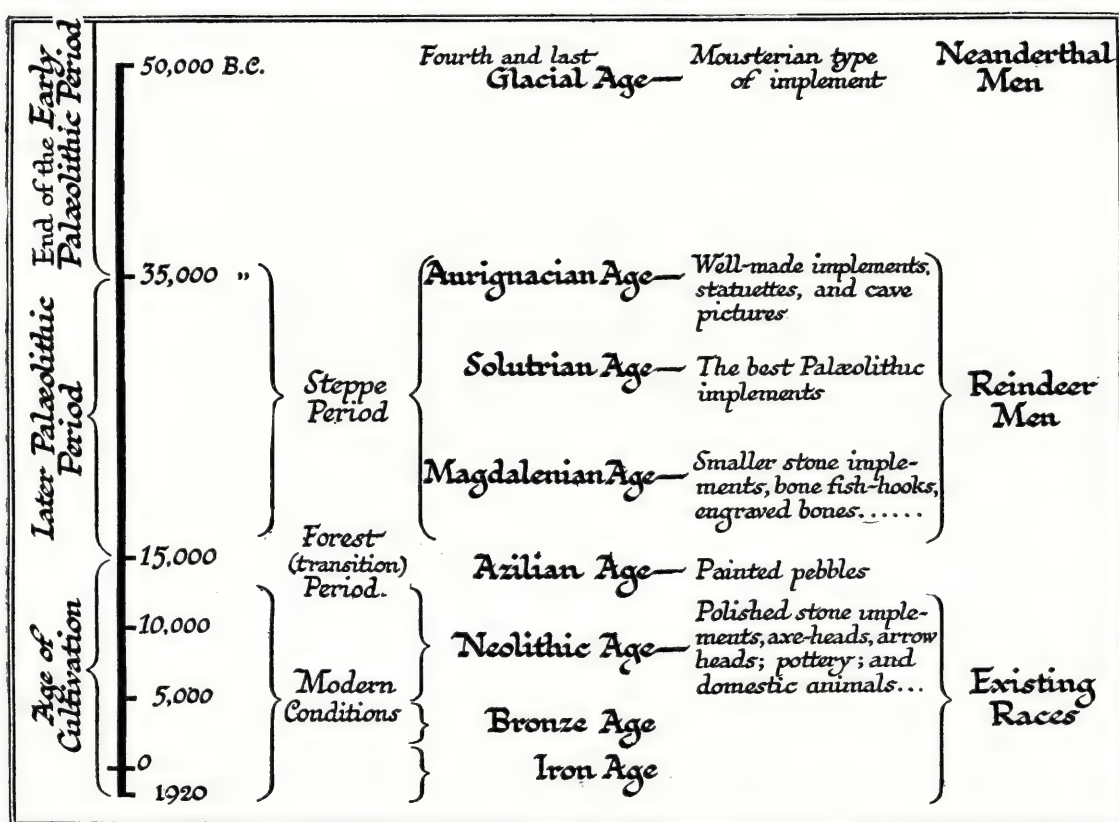
coloured designs upon leather. Some of the workmanship on bone was extraordinarily fine. Parkyn quotes from de Mortillet, about the Reindeer Age (Magdalenian) bone needles, that they "are much superior to those of later, even historical, times, down to the Renaissance. The Romans, for example, never had needles comparable to those of the Magdalenian epoch."

It is quite impossible at present to guess at



the relative lengths of these ages. We are not even positive about their relative relationship. Each lasted perhaps for two or three or more thousand years, as long a time as the whole period from Moses to our own day.

At last it would seem that circumstances began to turn altogether against these hunting Newer Palæolithic peoples who had flourished for so long in Europe. They disappeared. New kinds of men appeared in Europe, replacing them. These latter seem to have brought in



bow and arrows; they had domesticated animals and cultivated the soil. A new way of living, the Neolithic way of living, spread over the European area; and the life of the Reindeer Age and of the races of Reindeer men, the Later Palaeolithic men, after a reign vastly greater than the time between ourselves and the very earliest beginnings of recorded history, passed off the European stage.

§ 3

There is a disposition on the part of many writers to exaggerate the intellectual and physical qualities of these later Palaeolithic men and make a wonder of them.¹ Collectively considered, these people had remarkable gifts, but a little reflection will show they had almost as remarkable deficiencies. The tremendous

The Earliest True Men were Splendid Savages.

advance they display upon their Neanderthalian predecessors and their special artistic gift must not blind us to their very obvious limitations. For all the quantity of their brains, the quality was narrow and special. They had vivid perceptions, an acute sense of animal form, they had the real artist's impulse to render; so far they were fully grown human beings. But that disposition to paint and draw is shown to-day by the Bushmen, by Californian Indians, and by Australian black fellows; it is not a mark of all-round high intellectual quality. The cumulative effect of their drawings and paintings is very great, but we must not make the mistake of crowding all these achievements together in our minds as though they had suddenly flashed out upon the world in a brief interval of time, or as though they were all the achievements of one people. These races of Reindeer men were in undisturbed possession of Western Europe for a period at least four times as long as the interval between

¹ See, for example, H. G. F. Spurrell, *Modern Man and his Forerunners*, end of Chapter III.

ourselves and Moses, and through all that immense time they were free to develop and vary their life to its utmost possibilities. Their art constitutes their one claim to be accounted more than common savages.

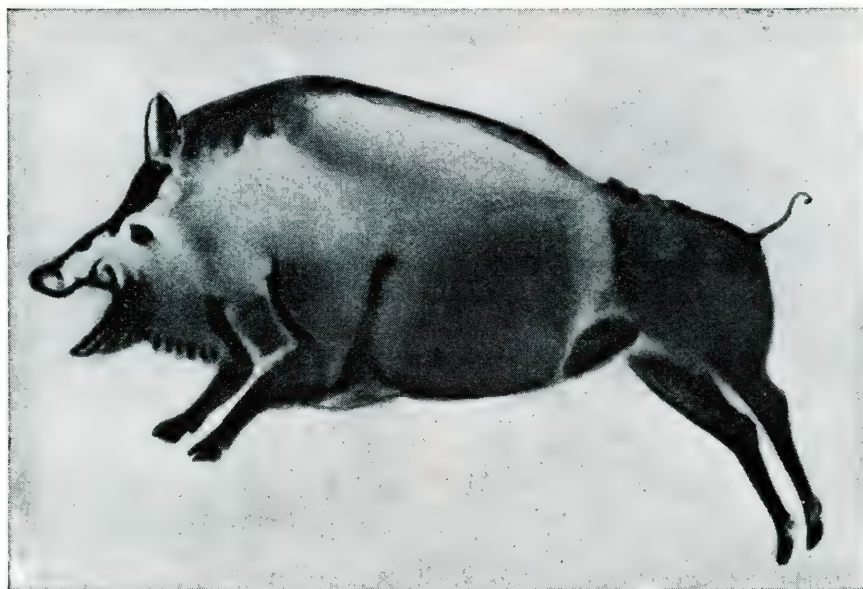
They were in close contact with animals, but they never seemed to have got to terms with any animal unless it was the horse. They had no dogs. They had no properly domesticated animals at all. They watched and drew and killed and ate. They do not seem to have cooked their food. Perhaps they scorched and grilled it; but they could not have done much more, because they had no cooking implements. Although they had clay available, and although there are several Palæolithic clay figures on record, they had *no pottery*. Although they had a great variety of flint and bone implements, they never rose to the possibilities of using timber for permanent shelters or such-like structures. They never made hafted axes or the like that would enable them to deal with timber. There is a suggestion in some of the drawings of a fence of stakes in which a mammoth seems to be entangled. But here we may be dealing with superimposed scratchings. They had *no buildings*. It is not even certain that they had tents or huts. They may have had simple skin tents. Some of the drawings seem to suggest as much. It is doubtful if they knew of the bow. They left no good arrowheads behind them. Certain of their implements are said to be "arrow-straighteners" by distinguished authorities, but that is about as much evidence as we have of arrows. They may have used sharpened sticks as arrows. They had *no cultivation* of grain or vegetables of any sort. Their women were probably squaws, smaller than the men; the earlier statuettes represent them as grossly fat, almost as the Bushmen women are often fat to-day. (But this may not be true of the Cro-Magnards.)

They clothed themselves, it would seem, in skins, if they clothed themselves at all. These skins they prepared with skill and elaboration, and towards the end of the age they used bone needles, no doubt to sew these pelts. One may guess pretty safely that they painted these skins, and it has even been supposed, printed off designs upon them from bone cylinders.

But their garments were mere wraps; there are no clasps or catches to be found. They do not seem to have used grass or such-like fibre for textiles. Their statuettes are naked. They were, in fact, except for a fur wrap in cold weather, naked painted savages.

These hunters lived on open steppes for a hundred centuries or so, five times the length of the Christian era. They were, perhaps, overtaken by the growth of the European forests, as the climate became milder and damper. When the wild horse and the reindeer diminished in Europe, and a newer type of human culture, with a greater power over food supply, a greater tenacity of settlement, and probably a larger social organization, arose, the Reindeer Men had to learn fresh ways of living or disappear. How far they learnt and mingled their strain with the new European populations, and how far they went under we cannot yet guess. Opinions differ widely. Wright lays much stress on the "great hiatus" between the Palæolithic and Neolithic remains, while Osborn traces the likeness of the former in several living populations. In the region of the Doubs and of the Dordogne in France, many individuals are to be met with to this day with skulls of the "Cro-Magnon" type. Apparently the Grimaldi type of men has disappeared altogether from Europe. Whether the Cro-Magnon type of men mingled completely with the Neolithic peoples, or whether they remained distinct and held their own in favourable localities to the north and west, following the reindeer over Siberia and towards America, which at that time was continuous with Siberia, or whether they disappeared altogether from the world, is a matter that can be only speculated about at present. There is not enough evidence for a judgment. Possibly they mingled to a certain extent. There is little to prevent our believing that they survived without much intermixture for a long time in north Asia, that "pockets" of them remained here and there in Europe, that there is a streak of their blood in most European peoples to-day, and that there is a much stronger streak, if not a predominant strain, in the Mongolian and American races.¹

¹ Upon this question W. J. Sollas' *Ancient Hunters* is very full and suggestive.



LATER PALÆOLITHIC PAINTING OF A BOAR.

§ 4

It was about 12,000 or fewer years ago that, with the spread of forests and a great change of the fauna, the long prevalence of the hunting life in Europe drew to its end. Reindeer vanished. Changing conditions frequently bring with them new diseases. There may have been prehistoric pestilences. For many centuries there may have been no men in Britain or Central Europe (Wright). For a time there were in Southern Europe drifting communities of some little known people who are called the Azilians. They may have been transition generations; they may have been a different race. We do not know. Some authorities incline to the view that the Azilians were the first wave of a race which, as we shall see later, has played a great part in populating Europe, the dark-white or Mediterranean or Iberian race. These Azilian people have left behind them a multitude of pebbles, roughly daubed with markings of an unknown purport (see illus. p. 57). The use or significance of these Azilian pebbles is still a profound mystery. Was this some sort of token writing? Were they counters in some game? Did the Azilians play with these pebbles or tell a story with them, as imaginative children will do with bits of wood and stone nowadays? At present we are unable to cope with any of these questions.

Hunters
give place
to Herdsmen.

We will not deal here with the other various peoples who left their scanty traces in the world during the close of the New Palæolithic period, the spread of the forests where formerly there had been steppes, and the wane of the hunters, some 10,000 or 12,000 years ago. We will go on to describe the new sort of human community that was now spreading over the northern hemisphere, whose appearance marks what is called the *Neolithic Age*. The map of the world was assuming something like its present outlines, the landscape and the flora and fauna were taking on their existing characteristics. The prevailing animals in the spreading woods of Europe were the royal stag, the great ox, and the bison; the mammoth and the musk ox had gone. The great ox, or aurochs, is now extinct, but it survived in the German forests up to the time of the Roman Empire. It was never domesticated.¹ It stood eleven feet high at the shoulder, as high as an elephant. There were still lions in the Balkan peninsula, and they remained there until about 1,000 or 1,200 B.C. The lions of Würtemberg and South Germany in those days were twice the size of the modern lion. South Russia and Central Asia were thickly wooded then, and there were elephants in Mesopotamia and Syria,

¹ But our domestic cattle are derived from some form of aurochs—probably from some lesser Central Asiatic variety.—H. H. J.

and a fauna in Algeria that was tropical African in character.

Hitherto men in Europe had never gone further north than the Baltic Sea or the English midlands, but now Ireland, the Scandinavian peninsula, and perhaps Great Russia were becoming possible regions for human occupation. There are no Palæolithic remains in Sweden or Norway, nor in Ireland or Scotland. Man, when he entered these countries, was

have allowed them to wander across the land that is now cut by Bering Straits, and so reach the American continent. They spread thence southward, age by age. When they reached South America, they found the giant sloth (the *Megatherium*), the glyptodon, and many other extinct creatures, still flourishing. The glyptodon was a monstrous South American armadillo, and a human skeleton has been found by Roth buried beneath its huge tortoise-like shell.²



apparently already at the Neolithic stage of social development.

§ 5

Nor is there any convincing evidence of man in America before the end of the Pleistocene.¹

The same relaxation of the climate that permitted the retreat of the reindeer hunters into Russia and Siberia, as the Neolithic tribes advanced, may

¹ "The various finds of human remains in North America for which the geological antiquity has been claimed have been thus briefly passed under review. In every instance where enough of the bones is preserved for comparison, the evidence bears witness against the geological antiquity of the remains and for their

All the human remains in America, even the earliest, it is to be noted, are of an Amer-Indian character. In America there does not seem to have been any preceding races of sub-men. Man was fully man when he entered America. The old world was the nursery of the sub-races of mankind.

close affinity to or identity with the modern Indian." (Smithsonian Institute. Bureau of American Ethnology, Bulletin 33. Dr. Hrdlicka.)

But J. Deniker quotes evidence to show that eoliths and early palæoliths have been found in America. See his compact but full summary of the evidence and views for and against in his *Races of Man*, pp. 510, 511.

² "Questioned by some authorities," says J. Deniker in *The Races of Man*,

XI

NEOLITHIC MAN IN EUROPE

§ 1

THE Neolithic phase of human affairs began in Europe about 10,000 or 12,000 years ago. But probably men had reached the Neolithic stage elsewhere some thousands of years earlier. Neolithic men came slowly into Europe from the south or south-east as the reindeer and the open steppes gave way to forest and modern European conditions.

The Neolithic stage in culture is characterized by: (1) the presence of polished stone implements, and in particular the stone *axe*, which was perforated so as to be the more effectually fastened to a wooden handle, and which was probably used rather for working wood than in conflict. There are also abundant arrow heads. The fact that some implements are polished does not preclude the presence of great quantities of implements of unpolished stone. But there are differences in the make between even the unpolished tools of the Neolithic and of the Palæolithic Period. (2) The beginning of a sort of agriculture, and the use of plants and seeds. But at first there are abundant evidences that hunting was still of great importance in the Neolithic Age. Neolithic man did not at first sit down to his agriculture. He took snatch crops. He settled later. (3) Pottery and proper cooking. The horse is no longer eaten. (4) Domesticated animals. The dog appears very early. The Neolithic man had domesticated cattle, sheep, goats, and pigs. He was a huntsman turned herdsman of the herds he once hunted.¹ (5) Plaiting and weaving.

These Neolithic people probably "migrated" into Europe, in the same way that the Reindeer Men had migrated before them; that is to say, generation by generation and century by century, as the climate changed, they spread after their accustomed food. They were not "nomads." Nomadism, like civilization, had still to be developed. At present we are quite un-

able to estimate how far the Neolithic peoples were newcomers, and how far their arts were developed or acquired by the descendants of some of the hunters and fishers of the Later Palæolithic Age.

Whatever our conclusions in that matter, this much we may say with certainty; there is no great break, no further sweeping away of one kind of man and replacement by another kind between the appearance of the Neolithic way of living and our own time. There are invasions, conquests, extensive emigrations and intermixtures, but the races as a whole carry on and continue to adapt themselves to the areas into which they began to settle in the opening of the Neolithic Age. The Neolithic men of Europe were white men ancestral to the modern Europeans. They may have been of a darker complexion than many of their descendants; of that we cannot speak with certainty. But there is no real break in culture from their time onward until we reach the age of coal, steam, and power-driven machinery that began in the eighteenth century.

After a long time gold, the first known of the metals, appears among the bone ornaments with jet and amber. Irish Neolithic remains are particularly rich in gold. Then, perhaps 6,000 or 7,000 years ago in Europe, Neolithic people began to use copper in certain centres, making out of it implements of much the same pattern as their stone ones. They cast the copper in moulds made to the shape of the stone implements. Possibly they first found native copper and hammered it into shape.² Later—we will not venture upon figures—men had found out how to get copper from its ore. Perhaps, as Lord Avebury suggested, they discovered the secret of smelting by the chance putting of lumps of copper ore among the ordinary stones with which they built the fire pits they used for cooking. In China, Hungary, Cornwall, and elsewhere copper ore

¹ See Peisker, *Cambridge Medieval History*, Vol. I, for some interesting views upon domestication.—E. B.

² Native copper is still found to-day in Italy, Hungary, Cornwall, and many other places.

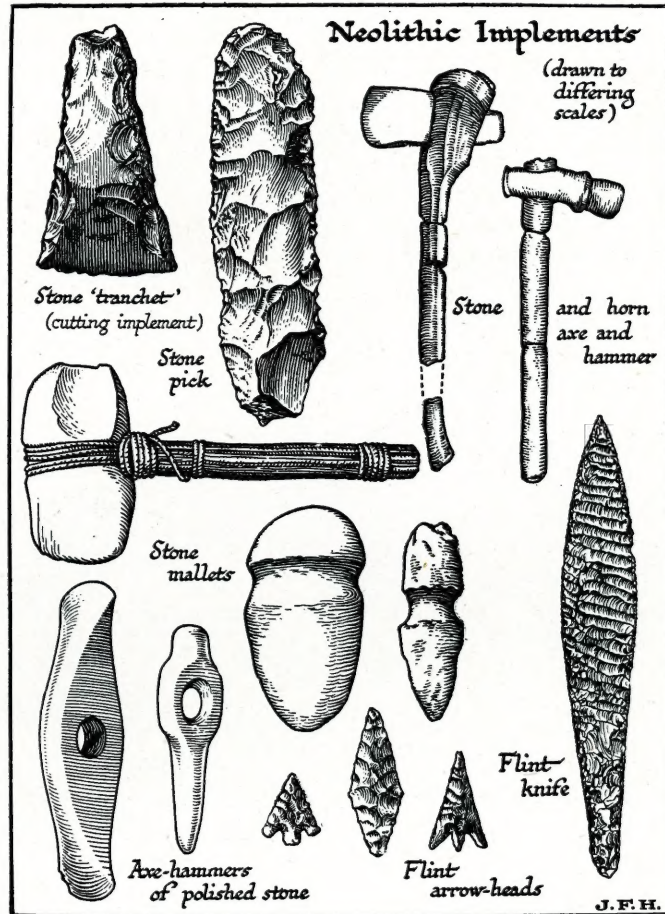
and tinstone occur in the same veins; it is a very common association, and so, rather through dirtiness than skill, the ancient smelters, it may be, hit upon the harder and better bronze, which is an alloy of copper and tin.¹ Bronze is not only harder than copper, but the mixture of tin and copper is more fusible and easier to reduce.

The so-called "pure copper" implements usually contain a small proportion of tin, and there are no tin implements known, nor very much evidence to show, that early men knew of tin as a separate metal.^{2 3} The plant of a prehistoric copper smelter has been found in Spain, and the material of bronze foundries in various localities. The method of smelting revealed by these finds carries out Lord Avebury's suggestion. In India, where zinc and copper ore occur together, brass (which is an alloy of the two metals) was similarly hit upon.

Finally, perhaps as early as 3,000 years ago in Europe, and even earlier in Asia Minor, men began to smelt iron. Once smelting was known to men, there is no great marvel in the finding of iron. They smelted iron by blowing up a charcoal fire, and wrought it by heating and hammering. They produced it at first in comparatively small pieces⁴; its appearance worked a revolution in weapons and implements; but it did not suffice to change the general character of men's surroundings. Much the same daily life that was being led by the more settled Neolithic men 10,000 years ago, was being led by peasants in out-of-the-way places all over

Europe at the beginning of the eighteenth century.

People talk of the Stone Age, the Bronze Age, and the Iron Age in Europe, but it is misleading to put these ages as if they were of equal importance in history. Much truer is it to say that there was:



(1) An *Early Palaeolithic Age*, of vast duration; (2) a *Later Palaeolithic Age*, that lasted not a tithe of the time; and (3) the *Age of Cultivation*, the age of the white men in Europe, which began 10,000 or at most 12,000 years ago, of

of Cyprus bronze which contains antimony; a good deal which seems to be tin is antimony—the ancients trying to get tin, but actually getting antimony and thinking it was tin.—J. L. M.

⁴ In connection with iron, note the distinction of ornamental and useful iron. Ornamental iron, a rarity, perhaps meteoric, as jewellery or magical stuff, occurs in East Europe sporadically in the time of the XVIIIth Dynasty. This must be distinguished from the copious useful iron which appears in Greece much later from the North.—J. L. M.

¹ This view of the origin of bronze is that of Dr Gowland, *The Metals in Antiquity* (Huxley Lecture 1912). But Lord Avebury quotes the verbal opinion of the late Lord Swansea against this view, and sets it aside without further argument.

² Ridgeway (*Early Age of Greece*) says a lump of tin has been found in the Swiss pile-dwelling deposits.

³ Tin was known as a foreign import in Egypt under the XVIIIth Dynasty: there is (rare) Mycenaean tin, and there are (probably later, but not clearly dated) tin objects in the Caucasus. But it is very difficult to distinguish tin from antimony. There is a good deal

which the Neolithic Period was the beginning, and which is still going on.

§ 2

We do not know yet the region in which the ancestors of the white and whitish Neolithic peoples worked their way up from the Palæolithic stage of human development. Probably it was somewhere about South Western Asia, or in some region now submerged beneath the Mediterranean Sea or the Indian Ocean, that, while the Neanderthal men still lived their hard lives in the bleak climate of a glaciated Europe, the ancestors of the white men developed the rude arts of *their*

Where did
Neolithic
Culture
arise?

Later Palæolithic period. But they do not seem to have developed the artistic skill of their more northerly kindred, the European Later Palæolithic races. And through the hundred centuries or so while Reindeer men were living under comparatively unprogressive conditions upon the steppes of France, Germany, and Spain, these more-favoured and progressive people to the south were mastering agriculture, learning to develop their appliances, taming the dog, domesticating cattle, and, as the climate to the north mitigated and the equatorial climate grew more tropical, spreading northward. All these early chapters of our story have yet to be disinterred. They will probably be found in Asia Minor, Persia, Arabia, India, or North Africa, or beneath the Mediterranean waters. Twelve thousand years ago, or thereabouts—we are still too early for anything but the roughest chronology—Neolithic peoples were scattered all over Europe, North Africa, and Asia.

§ 3

It will be of interest here to give a brief account of the life of the European Neolithic

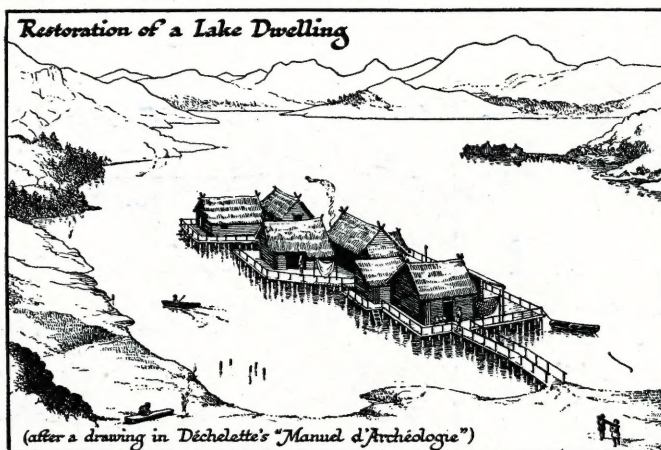
people before the appearance of metals. We get our light upon that life from various sources.

Everyday
Neolithic
Life.

They scattered their refuse about, and in some places (*e.g.* on the Danish coast) it accumulated in great heaps, known as the kitchen-middens. They buried some of their people, but not the common herd, with great care and distinction, and made huge heaps of earth over their sepulchres; these heaps are the barrows or dolmens which contribute a feature to the European, Indian, and American scenery in many districts to this day. In connection with these mounds, or independently of them, they set up great stones (megaliths), either singly or in groups, of

which Stonehenge in Wiltshire and Carnac in Brittany are among the best-known examples. In various places their villages are still traceable.

One fruitful source of knowledge about Neolithic life comes from Switzerland, and was first revealed by



the very dry winter of 1854, when the water level of one of the lakes, sinking to an unheard-of lowness, revealed the foundations of prehistoric pile dwellings of the Neolithic and early Bronze Ages, built out over the water after the fashion of similar homes that exist to-day in Celebes and elsewhere. Not only were the timbers of those ancient platforms preserved, but a great multitude of wooden, bone, stone, and earthenware utensils and ornaments, remains of food and the like, were found in the peaty accumulations below them. Even pieces of net and garments have been recovered. Similar lake dwellings existed in Scotland, Ireland, and elsewhere—there are well-known remains at Glastonbury in Somersetshire; in Ireland lake dwellings were inhabited from prehistoric times up to the days when O'Neil of Tyrone was fighting against the English before the plantation of Scotch colonists

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